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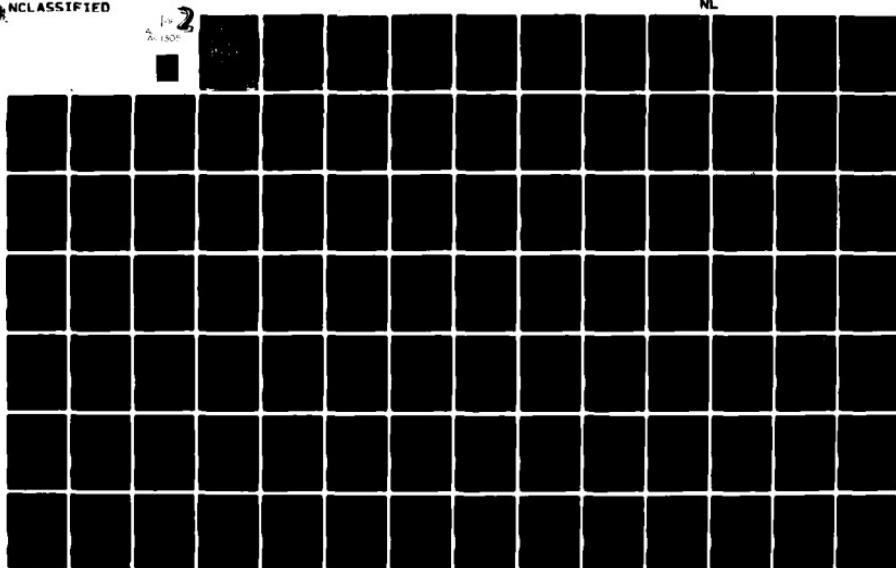
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DEPARTMENT OF THE ARMY JUSTIFICATION OF ESTIMATES FOR FISCAL YE--ETC(U)

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LAW I  
**DEPARTMENT OF THE  
ARMY**

**JUSTIFICATION OF ESTIMATES FOR FISCAL YEAR 1982, (U)**  
**Submitted to Congress**

**JANUARY 1981.**



**RESEARCH DEVELOPMENT, TEST AND EVALUATION, ARMY**

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-- 1 OF 12

-- 1 - AD NUMBER: A097382  
-- 2 - UNCLASSIFIED TITLE: DEPARTMENT OF THE ARMY JUSTIFICATION OF  
-- ESTIMATES FOR FISCAL YEAR 1982, SUBMITTED TO CONGRESS JANUARY 1981.  
-- PART 5. OTHER PROCUREMENT ARMY.

--11 - REPORT DATE: JAN 1981

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-- 2 OF 12

-- 1 - AD NUMBER: A097381  
-- 2 - UNCLASSIFIED TITLE: DEPARTMENT OF THE ARMY JUSTIFICATION OF  
-- ESTIMATES FOR FISCAL YEAR 1982, SUBMITTED TO CONGRESS JANUARY 1981.  
-- PART 4. AMMUNITION.

--11 - REPORT DATE: JAN 1981

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-- 3 OF 12

-- 1 - AD NUMBER: A097380  
-- 2 - UNCLASSIFIED TITLE: DEPARTMENT OF THE ARMY JUSTIFICATION OF  
-- ESTIMATES FOR FISCAL YEAR 1982, SUBMITTED TO CONGRESS, JANUARY 1981.  
-- PART 3. WEAPONS AND TRACKED COMBAT VEHICLES.

--11 - REPORT DATE: JAN 1981

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-- 4 OF 12

-- 1 - AD NUMBER: A097379

-- 2 - UNCLASSIFIED TITLE: DEPARTMENT OF THE ARMY JUSTIFICATION OF  
-- ESTIMATES FOR FISCAL YEAR 1982, SUBMITTED TO CONGRESS JANUARY 1981.  
-- PART 2. MISSILES.

--11 - REPORT DATE: JAN 1981

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-- 5 OF 12

-- 1 - AD NUMBER: A097378  
-- 2 - UNCLASSIFIED TITLE: DEPARTMENT OF THE ARMY JUSTIFICATION OF  
-- ESTIMATES FOR FISCAL YEAR 1982, SUBMITTED TO CONGRESS JANUARY 1981.  
-- PART 1. AIRCRAFT.

--11 - REPORT DATE: JAN 1981

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-- ESTIMATES FOR FISCAL YEAR 1981, SUBMITTED TO CONGRESS JANUARY 1980.  
-- PROCUREMENT PROGRAMS, AIRCRAFT, MISSILES, WEAPONS & TRACKED COMBAT  
-- VEHICLES, AMMUNITION AND OTHER PROCUREMENT, ARMY, PART 5.

--11 - REPORT DATE: JAN \* 1980

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-- 7 OF 12

-- 1 - AD NUMBER: A082808

-- 6 - UNCLASSIFIED TITLE: DEPARTMENT OF THE ARMY JUSTIFICATION OF

-- ESTIMATES FOR FISCAL YEAR 1981, SUBMITTED TO CONGRESS JANUARY 1980.  
-- PROCUREMENT PROGRAMS, AIRCRAFT, MISSILES, WEAPONS & TRACKED COMBAT  
-- VEHICLES, AMMUNITION AND OTHER PROCUREMENT, ARMY, PART 4.

--11 - REPORT DATE: JAN \* 1980

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-- 8 OF 12

-- 1 - AD NUMBER: A082807

-- 6 - UNCLASSIFIED TITLE: DEPARTMENT OF THE ARMY JUSTIFICATION OF  
-- ESTIMATES FOR FISCAL YEAR 1981, SUBMITTED TO CONGRESS JANUARY 1980.  
-- PROCUREMENT PROGRAMS, AIRCRAFT, MISSILES, WEAPONS & TRACKED COMBAT  
-- VEHICLES, AMMUNITION AND OTHER PROCUREMENT, ARMY, PART 3.

--11 - REPORT DATE: JAN \* 1980

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-- 9 OF 12

-- 1 - AD NUMBER: A082806

-- 6 - UNCLASSIFIED TITLE: DEPARTMENT OF THE ARMY JUSTIFICATION OF  
-- ESTIMATES FOR FISCAL YEAR 1981, SUBMITTED TO CONGRESS JANUARY 1980.  
-- PROCUREMENT PROGRAMS, AIRCRAFT, MISSILES, WEAPONS & TRACKED COMBAT  
-- VEHICLES, AMMUNITION AND OTHER PROCUREMENT, ARMY, PART 2.

--11 - REPORT DATE: JAN \* 1980

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-- 10 OF 12

-- 1 - AD NUMBER: A082805

-- 6 - UNCLASSIFIED TITLE: DEPARTMENT OF THE ARMY JUSTIFICATION OF  
-- ESTIMATES FOR FISCAL YEAR 1981, SUBMITTED TO CONGRESS JANUARY 1980.  
-- PROCUREMENT PROGRAMS, AIRCRAFT, MISSILES, WEAPONS & TRACKED COMBAT  
-- VEHICLES, AMMUNITION AND OTHER PROCUREMENT, ARMY, PART 1.

--11 - REPORT DATE: JAN \* 1980

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-- 11 OF 12

-- 1 - AD NUMBER: A082154

-- 6 - UNCLASSIFIED TITLE: DEPARTMENT OF THE ARMY JUSTIFICATION OF  
-- ESTIMATES FOR FISCAL YEAR 1981, SUBMITTED TO CONGRESS JANUARY 1980.

--11 - REPORT DATE: JAN \* 1980

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-- 12 OF 12

-- 1 - AD NUMBER: A065293

-- 6 - UNCLASSIFIED TITLE: DEPARTMENT OF THE ARMY JUSTIFICATION OF  
-- ESTIMATES FOR FISCAL YEAR 1980, SUBMITTED TO CONGRESS JANUARY 1979.  
-- PROCUREMENT PROGRAMS, AIRCRAFT, MISSILES, WEAPONS AND TRACKED COMBAT  
-- VEHICLES, AMMUNITION AND OTHER PROCUREMENT, ARMY, PART 1 THRU 5.

--11 - REPORT DATE: JAN \* 1979

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DEPARTMENT OF THE ARMY  
RESEARCH, DEVELOPMENT, TEST AND EVALUATION, ARMY  
TABLE OF CONTENTS

Section 1: Budget Appendix Extract

Appropriation Language . . . . .	1
Program and Financing Schedules . . . . .	2
Object Classification Schedule . . . . .	2
Personnel Summary . . . . .	7
<u>Section 2:</u> Program Element Listing	
Table of Contents . . . . .	8
Introduction and Explanation of Contents . . . . .	9
Summary by Research Categories (Program) . . . . .	10
Summary by Budget Activities . . . . .	10
Details by Budget Activity	
Technology Base . . . . .	10
Advanced Technology Development . . . . .	13
Strategic Programs . . . . .	15
Tactical Programs . . . . .	15
Intelligence and Communications	
Defensewide Mission Support . . . . .	20
Defensewide Mission Support . . . . .	21
	21
<u>Section 3:</u> Performer Distribution	
	23
<u>Section 4:</u> Installation Analysis (In-House Installations)	
	24
<u>Section 5:</u> Analysis of Reimbursable Program	
	52
<u>Section 6:</u> Federal Contract Research Centers	
	55

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TABLE OF CONTENTS

	<u>Page No.</u>
<u>Section 7:</u> Major Improvements to and Construction of Government-Owned Facilities Funded by ROTE, Army Appropriation, 1947	89
<u>Section 8:</u> Project Data for Construction at Government-Owned Facilities Funded by ROTE, Army Appropriation	94

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DEPARTMENT OF THE ARMY  
RESEARCH, DEVELOPMENT, TEST AND EVALUATION, ARMY  
APPROPRIATION LANGUAGE

Section 1

For expenses necessary for basic and applied scientific research, development, test and evaluation, including maintenance, rehabilitation, lease, and operation of facilities and equipment, as authorized by law; §3,086,737/ \$3,57,200, to remain available for obligation until September 30, 1982/ 1981. (10 U.S.C. 2353, 4503; Department of Defense Appropriation Act, 1980; additional authorizing legislation to be proposed.)

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15 JAN 81

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Research, Development, Test, and Evaluation, Army

**Program and Financing (in thousands of dollars)**

Identification code	21-2040-0-1-061	Budget Plan (Amounts for RD&E actions programmed)			Obligations			
		1980 actual	1981 est.	1982 est.	1980 actual	1981 est.	1982 est.	
<b>Program by activities:</b>								
<b>Direct:</b>								
1. Technology base	462,432	505,607	616,710	460,502	500,600	609,500		
2. Advanced technology development	140,164	166,316	207,556	134,992	167,800	204,700		
3. Strategic programs	241,479	268,246	345,516	241,702	254,800	340,500		
4. Tactical programs	1,470,398	1,522,643	1,614,332	1,78,349	1,16,796	1,605,754		
5. Intelligence and communications	32,604	37,472	55,336	30,409	39,800	54,100		
6. Defensewide mission support	499,454	581,473	737,748	498,551	574,700	727,500		
<b>Total direct</b>	<b>2,846,431</b>	<b>3,086,757</b>	<b>3,877,200</b>	<b>2,844,605</b>	<b>3,654,496</b>	<b>3,542,054</b>		
<b>Reimbursable program (total)</b>	<b>609,696</b>	<b>562,300</b>	<b>552,500</b>	<b>560,670</b>	<b>600,818</b>	<b>554,000</b>		
<b>10.0001 Total</b>	<b>3,455,126</b>	<b>3,649,057</b>	<b>4,129,700</b>	<b>3,405,176</b>	<b>3,655,314</b>	<b>4,096,054</b>		
<b>Financing:</b>								
<b>Offsetting collections from:</b>								
11.0001 Federal funds	-596,798	-539,450	-530,700	-580,827	-539,450	-530,700		
13.0001 Trust funds	+100	-225	-225	-1,091	-225	-225		
4.0001 Non-federal sources	-10,797	-22,625	-21,575	-10,575	-22,625	-21,575		
7.0001 Recovery of prior year obligations, ob1 plan	.....	.....	.....	1,573	.....	.....		
<b>Unobligated balance available, start of year:</b>								
21.4.001 For completion of prior year budget plans	.....	.....	.....	-232,216	-261,691	-255,434		
21.4.002 Available to finance new budget plans	-2,000	.....	.....	-2,000	.....	.....		
21.4.003 Reprogramming from or to prior year budget plan	-5,847	.....	.....	.....	.....	.....		
23.4.001 Unobligated balance transferred to other accounts	2,000	.....	.....	2,000	.....	.....		
24.4.001 Unobligated balance available, end of year	5,847	.....	.....	261,691	255,434	289,040		
25.0.001 Unobligated balance lapsing	.....	.....	.....	5,847	.....	.....		
<b>39.0001 Budget authority:</b>	<b>2,846,431</b>	<b>3,086,757</b>	<b>3,677,200</b>	<b>2,846,431</b>	<b>3,086,757</b>	<b>3,577,200</b>		
40.0.001 Appropriation:	2,853,331	3,086,757	3,577,200	2,853,331	3,086,757	3,577,200		
41.0.001 Transferred to other accounts	-10,100	.....	.....	-10,100	.....	.....		
42.0.001 Transferred from other accounts	1,200	.....	.....	1,200	.....	.....		
<b>43.0.001 Appropriation (adjusted)</b>	<b>2,844,431</b>	<b>3,086,757</b>	<b>3,577,200</b>	<b>2,844,431</b>	<b>3,086,757</b>	<b>3,577,200</b>		
50.0.001 Reappropriation	2,000	.....	.....	2,000	.....	.....		
<b>Relation of obligations to outlays:</b>								
71.0.001 Obligations incurred, net	.....	.....	.....	2,812,682	3,033,014	3,543,554		
72.4.001 Unobligated balance, start of year	.....	.....	.....	1,044,466	1,136,992	1,338,006		
74.4.001 Unobligated balance, end of year	.....	.....	.....	-1,185,992	-1,536,006	-1,413,560		
77.0.001 Adjustments in expired accounts	.....	.....	.....	2,552	.....	.....		
78.0.001 Adjustments in unexpired accounts	.....	.....	.....	-1,573	.....	.....		
<b>90.0.001 Outlays</b>	<b>2,707,031</b>	<b>2,511,000</b>	<b>3,468,000</b>	<b>2,707,031</b>	<b>2,511,000</b>	<b>3,468,000</b>		

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## Army

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Research, Development, Test, and Evaluation, Army

Identification code 21-2040-0-1-081

115 JAN 81

Program and Financing (in thousands of dollars)

	Budget plan (amounts for RD&E actions programmed)	1979 Fiscal year program obligations
1980 actual		
1981 est.		
1982 est.		
1980 actual	1981 est.	1982 est.

## Program by activities:

## Direct:

1. Technology base
2. Advanced technology development
3. Strategic programs
4. Tactical programs
5. Intelligence
6. Defensewide mission support

## Total direct

## Reimbursable program (total)

10,000) Total

## Financing:

## Offsetting collections from:

- 11.0001 Adjustment to prior year budget plan
- 13.0001 Adjustment to by trust fund orders
- 14.0001 Adjustment to non-federal sources
- 17.0001 Recovery of prior year obligations
- 21.40001 Unobligated balance available, start of year;
- 21.40002 Available to finance new budget plans
- 23.40001 Reprogramming from or to prior year budget plans
- 25.0001 Unobligated balance transferred to other accounts
- 40.0001 Unobligated balance lapsing

## Budget authority

	20,189	5,224	1,160	78,960	2,225	23,518	131,266	80,454	211,740
1980 actual									
1981 est.									
1982 est.									

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Army

Research, Development, Test, and Evaluation, Army

15 JAN 81

Identification code	21-2040-0-1-051	Program and Financing (in thousands of dollars)		1980 Fiscal year program		
		Budget Plan (amounts for RDT&E actions programmed)	Obligations	1980 actu.	1981 est.	1982 est.
		1980 actu.	1981 est.	1982 est.	1980 actu.	1981 est.

## Program by activities:

Direct:						
1. Technology base	462,432				440,303	22,129
2. Advanced technology development	140,164				129,766	10,396
3. Strategic programs	241,478				240,542	937
4. Technical programs	1,470,398				1,399,389	71,009
5. Intelligence and communications	32,504				28,844	4,320
6. Defensewide mission support	499,454				475,033	24,421
Total direct	2,846,431				2,713,219	133,212
Reimbursable program (total)	608,995				480,216	128,479
10.0001 Total	3,455,126				3,193,436	261,691
Financing:						
Offsetting collections from:						
Federal funds	-596,798				-596,798	
Trust funds	-1,100				-1,100	
Non-federal sources	-10,797				-10,797	
Unobligated balance available, start of year						
Unobligated balance available, end of year						
39.0001 Budget authority	2,846,431				2,846,431	
Budget authority:						
40.0001 Appropriation	2,853,331				2,853,331	
Transferred to other accounts	-10,100				-10,100	
Transferred from other accounts	1,200				1,200	
42.0001 Appropriation (adjusted)	2,844,431				2,844,431	
50.0001 Resappropriation	2,000				2,000	

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Army

Research, Development, Test, and Evaluation, Army

16 JAN 81

		Program and Financing (in thousands of dollars)		1982 Fiscal Year program			
		Budget plan (amounts for RDT&E actions programmed)		Obligations			
Identification code		1980 actual	1981 est.	1982 est.	1980 actual	1981 est.	1982 est.
<b>Program by activities:</b>							
Direct:							
1.	Technology base	.....	.....	616,710	.....	.....	582,364
2.	Advanced technology development	.....	.....	207,556	.....	.....	195,788
3.	Strategic programs	.....	.....	345,516	.....	.....	326,117
4.	Tactical programs	.....	.....	1,614,332	.....	.....	1,523,898
5.	Intelligence and communications	.....	.....	65,338	.....	.....	52,108
6.	Defensewide mission support	.....	.....	737,746	.....	.....	696,306
Total direct							
		.....	.....	3,677,200	.....	.....	3,376,581
		.....	.....	552,500	.....	.....	464,039
Reimbursable program (total)							
		.....	.....	4,129,700	.....	.....	3,840,620
<b>Total</b>							
<b>Financing:</b>							
Offsetting collections from:							
11.0001	Federal funds	.....	.....	-530,700	.....	.....	-530,700
13.0001	Trust funds	.....	.....	-225	.....	.....	-225
14.0001	Non-federal sources	.....	.....	-21,575	.....	.....	-21,575
24.4001	Unobligated balance available, end of year	.....	.....	.....	.....	.....	289,080
40.0001	Budget authority	.....	.....	3,677,200	.....	.....	3,577,200

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Army Research, Development, Test, and Evaluation, Army

16 JAN 81

**Object Classification (in thousands of dollars)**

Identification code	21-2040-0-1-051	1980 actual	1981 est.	1982 est.
<b>Direct obligations</b>				
Personnel compensation:				
Full-time permanent positions				
111.101	294,635	384,836	359,000	359,000
121.001	2,607	3,000	3,000	3,000
111.301	13,121	14,000	14,000	14,000
111.601	-	-	-	-
111.901	310,363	401,836	376,000	376,000
Total personnel compensation				
Personnel benefits: civilian personnel				
112.101	29,516	38,763	37,900	37,900
121.001	20,936	32,200	36,300	36,300
122.001	6,596	13,500	14,000	14,000
123.201	18,460	24,500	27,900	27,900
124.001	692	2,700	3,500	3,500
125.002	248,500	270,000	312,600	312,600
125.003	2,100,108	2,134,697	2,673,954	2,673,954
126.001	48,676	80,400	102,100	102,100
131.001	59,243	54,700	57,400	57,400
141.001	1,116	1,200	1,200	1,200
199.001	2,644,506	3,054,496	3,562,054	3,562,054
Total direct obligations				
<b>Reimbursable obligations:</b>				
Personnel compensation:				
211.101	139,000	98,100	106,200	106,200
Full-time permanent positions				
212.101	13,215	10,000	10,200	10,200
221.001	12,331	10,900	12,100	12,100
222.001	3,674	1,200	1,400	1,400
223.101	4,000	4,900	5,100	5,100
224.001	400	600	600	600
225.002	83,300	44,800	105,900	105,900
225.003	236,978	366,618	257,400	257,400
226.001	46,086	80,200	46,200	46,200
231.001	21,686	11,500	9,900	9,900
299.001	660,670	600,818	654,000	654,000
999.901	3,405,175	3,655,314	4,096,054	4,096,054
<b>Total obligations</b>				

**PERSONNEL SUMMARY**

TOTAL NUMBER OF PERMANENT POSITIONS	18,658	19,424	18,800
<b>TOTAL COMPENSABLE WORK YEARS:</b>			
FULL-TIME EQUIVALENT EMPLOYMENT			
AVERAGE EQUIVALENT OF OVERTIME AND HOLIDAY HOURS			
AVERAGE GS SALARY			
AVERAGE GS GRADE			
AVERAGE GS SALARY			
AVERAGE SALARY OF UNPAID POSITIONS			
<b>UNCLASSIFIED</b>			

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DEPARTMENT OF THE ARMY  
RESEARCH, DEVELOPMENT, TEST AND EVALUATION, ARMY  
PROGRAM ELEMENT LISTING  
TABLE OF CONTENTS

Section 2

	Page No.
1. Introduction and Explanation of Contents . . . . .	9
Summaries by:	
1. Research Categories (Program) . . . . .	10
2. Budget Activities . . . . .	10
3. FYDP Programs . . . . .	10
Details by Budget Activity:	
1. Technology Base . . . . .	11
2. Advanced Technology Development . . . . .	13
3. Strategic Programs . . . . .	15
4. Tactical Programs . . . . .	15
5. Intelligence and Communications . . . . .	15
6. Defensewide Mission Support . . . . .	20
	21

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Section 2 (Contd)

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PROGRAM ELEMENT LISTING  
INTRODUCTION AND EXPLANATION OF CONTENTS

This section has been prepared for the purpose of providing summary program element budget information concerning the US Army Research, Development, Test and Evaluation Program. The listing is preceded by three summaries: the first by Research Categories (Program), the second by Budget Activities, and the third by FDP Programs.

A separate document, Descriptive Summaries, furnishes detail by project. In addition, it furnishes narrative information on all Research, Development, Test and Evaluation (R&T) program elements and projects of \$5.0 million or more. The index number in the right-hand column of this Program Element Listing refers to the appropriate page in the Descriptive Summaries. The funding information reflected in these volumes corresponds to that contained in the President's Budget except for FY 1980. FY 1980 in the Descriptive Summaries is restructured for comparability with the FY 1982 budget request.

A direct comparison of FY 1980, FY 1981, and FY 1982 data in this Program Element Listing with data submitted in the Program Element Listing dated January 1980 will reveal significant differences. Narrative explanation of these changes is included in the appropriate individual Program Element Descriptive Summary.

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FY 1982 R D T + E PROGRAM

## SUMMARY

EXHIBIT R-1

DATE 15 JAN 1981

## THOUSANDS OF DOLLARS

	FY 1980	FY 1981	FY 1982	FY 1983
<b>SUMMARY RECAP OF RESEARCH CATEGORIES</b>				
RESEARCH	130,701	144,577	179,203	212,003
EXPLORATORY DEVELOPMENT	331,731	361,030	437,507	492,980
ADVANCED DEVELOPMENT	631,150	701,441	921,950	1,367,634
ENGINEERING DEVELOPMENT	1,171,281	1,183,394	1,145,728	1,042,227
MANAGEMENT AND SUPPORT	448,323	534,627	687,561	739,686
RESEARCH AND DEVELOPMENT (FYDP PROGRAM 6)	2,713,186	2,325,069	3,371,949	3,854,535
OPERATIONAL SYSTEMS DEVELOPMENT	133,245	161,688	205,251	317,516
<b>TOTAL RESEARCH DEVELOPMENT TEST + EVAL. ARMY</b>	<b>2,846,431</b>	<b>3,086,757</b>	<b>3,577,200</b>	<b>4,172,053</b>
<b>SUMMARY RECAP OF BUDGET ACTIVITIES</b>				
TECHNOLOGY BASE	462,432	505,607	616,710	704,982
ADVANCED TECHNOLOGY DEVELOPMENT	140,164	166,316	207,551	324,991
STRATEGIC PROGRAMS	241,479	263,246	345,516	405,766
TACTICAL PROGRAMS	1,470,398	1,527,643	1,614,332	1,837,679
INTELLIGENCE AND COMMUNICATIONS	32,504	37,472	55,336	92,525
DEFENSEWIDE MISSION SUPPORT	499,454	581,473	737,746	802,169
<b>TOTAL RESEARCH DEVELOPMENT TEST + EVAL. ARMY</b>	<b>2,846,431</b>	<b>3,086,757</b>	<b>3,577,200</b>	<b>4,172,053</b>
<b>SUMMARY RECAP OF FYDP PROGRAMS</b>				
STRATEGIC FORCES	100,741	119,473	9,500	39,500
GENERAL PURPOSE FORCES	32,504	42,215	140,511	209,303
INTELLIGENCE AND COMMUNICATIONS	2,713,186	2,925,069	55,240	66,715
RESEARCH AND DEVELOPMENT (FYDP PROGRAM 6)			3,371,941	3,854,535
<b>TOTAL RESEARCH DEVELOPMENT TEST + EVAL. ARMY</b>	<b>2,846,431</b>	<b>3,086,757</b>	<b>3,577,200</b>	<b>4,172,053</b>

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## DEPARTMENT OF THE ARMY

FY 1982 R&amp;D PROGRAM

FEBRUARY 1981

## APPROPRIATION: 2040 A RESEARCH DEVELOPMENT TEST &amp; EVAL. ARMY

LINE ITEM NO. & TITLE	ITEM DESCRIPTION	ACT	FY 1980	FY 1981	BUDGET CATEGORIES	FY 1982	ESTIMATES	DESCRITIVE SUMMARY	PAGE NUMBER
1 6101A IN-HOUSE DEFENSE INDEPENDENT RESEARCH	1 17,151	15,49	21,962	24,368	1-1				
2 6102A DEFENSE INDEPENDENT SCIENCES	1 113,430	121,303	157,335	167,635	1-6				
3 62105A MATERIALS	1 127,345	11,525	11,53	12,557	1-90				
4 6211A ATMOSPHERIC AND THERMOCHEMICAL SCIENCES	1 5,97	5,711	6,340	6,350	1-95				
5 6212A FUZE/PROJECTILE AND EFFECTS/FLUIDICS	1 6,767	6,052	7,030	9,765	1-101				
6 62201A AIRCRAFT WEARABLE TECHNOLOGY	1 1,901	1,624	2,634	2,935	1-108				
7 62202A AIRCRAFT AVIATOR'S TECHNOLOGY	1 6,741	5,744	7,205	5,155	1-113				
8 62203A AIRCRAFT WEARABLE TECHNOLOGY	1 16,323	17,713	21,619	25,525	1-119				
9 6221A AIRCRAFT FLIGHT DYNAMICS	1 1,170	1,49	1,766	2,069	1-124				
10 6221A MISSILE FLIGHT DYNAMICS	1 28,119	26,067	33,753	42,075	1-129				
11 6226A HIGH ENERGY LASER TECHNOLOGY	1 1,320	16,275	27,503	32,077	1-136				
12 52101A TANK AND AUTOMATIC TECHNOLOGY	1 12,152	12,971	16,217	19,929	1-143				
13 62601A LARGE CAL AND NUCLEAR TECHNOLOGY	1 21,30	24,577	—	—	1-148				
14 62617A SMALL CAL AND FREE CHIP TECHNOLOGY	1 8,957	13,521	16,704	12,750	1-154				
15 62618A BALLISTICS TECHNOLOGY	1 16,176	17,487	25,233	28,790	1-160				
16 62620A CHEMICAL MULITIONS CHEMICAL CRAFT SP	1 6,615	5,260	8,760	7,012	1-165				
17 62701A COMMUNICATIONS EQUIPMENT	1 10,461	6,564	8,162	8,575	1-170				
18 62702A CHIEF SURVEY INSTRUMENTATION	1 5,113	5,133	4,593	4,593	1-178				
19 62703A DATA TRANSMISSION CRITERIA DEV	1 3,127	3,165	2,315	2,810	1-183				
20 62704A ELECTRONIC AND ELECTRODYNAMIC DEVICES	1 12,765	13,113	16,779	16,240	1-188				
21 62705A OPTICAL INSTRUMENTS AND OPTICAL DEVICES	1 11,760	11,411	15,344	14,450	1-199				
22 62706A INSTRUMENTS AND OPTICAL DEVICES	1 4,550	5,620	6,627	6,934	1-204				
23 62707A ELECTRONIC AND OPTICAL DEVICES	1 10,14	10,14	14,273	15,019	1-208				

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DEPARTMENT OF THE ARMY

ARTICLE IN REVIEW FOR RESEARCH DEVELOPMENT TEST EVALUATION

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DEFINITION: 2040 & RESEARCH DEVELOPMENT TEST + EVAL. ARMY							DATE: 1 JUN 1981
ITEM NUMBER	ITEM DESCRIPTION	ACT	FY 1980	FY 1981	FY 1982	FY 1983	DESCRIPTIVE SUMMARY PAGE NUMBER
1.0 63101A SYSTEMS HEALTH MONITOR PREVENTIVE	1	6,572	12,310	16,12	20,612	0	1-335
1B 63101A CRITICAL EQUIPMENT MONITOR	1	457			0		---
1C 63101A MEDICAL SYSTEMS IN CHEMICAL DEFENSE	1	2,125			0		---
1D 63101A FINE-STRUCTURE MACHINERY FOR MILITARY FACIL.	1			1,450	1,709	1,890	1-353
1E TECHNOLOGY BASE			305,607	616,710	704,383		
2.1 63102A MATERIALS SCALE UP	2	2,911	2,925	5,535	9,966	0	1-357
5.2 63101A FUELS AND LUBRICANTS	2	3,813	948	2,349	2,912	0	1-362
5.3 63201A AIRCRAFT POWER PLANTS AND PROPULSION	2	8,410	4,361	3,019	26,761	0	1-366
5.4 63206A AIRCRAFT WEAPONS	2	770	2,540	10,511	24,790	0	1-371
5.5 63207A AIRCRAFT AVIONICS EQUIPMENT	2	1,537	2,320	4,190	7,300	0	1-380
5.6 63205A AIR MOBILITY SUPPORT	2	301	1,856	1,842	3,201	0	1-385
5.7 63211A ROTARY WING CONTROLS, FORWARD STRUCTURES	2	5,057	12,921	27,071	41,084	0	1-390
5.8 63212A TILT ROTOR RESEARCH ACTIVITIES	2	950			0		---
5.9 63216A SYNTHETIC FLIGHT SIMULATORS	2	2,099	6,437	1,804	5,764	0	1-403
6.0 63218A AIRDROP EQUIP AND TECHNIQUES	2	665	1,263	2,752	4,709	0	1-411
6.1 63321A NOE AVIATION AND NAVIGATION EQUIPMENT	2		1,619	4,374	11,570	0	1-415
6.2 63307A TERMINAL GUIDED PROJECTILES	2	2,970	10,893	13,278	19,635	0	1-420
6.3 63313A RPL/ROCKET COMPONENTS	2	2,024	6,419	317	530	0	1-428
6.4 63314A HIGH ENERGY LASER COMPONENTS	2	19,000			0		---
6.5 63602A ADVANCED LAND MOB SYSTEMS CONCEPTS	2	17,915	34,428	9,421	16,614	0	1-432
6.6 63606A LANDMINES WARFARE, DARRIER DEV	2	2,076	4,631	6,923	9,518	0	1-436
6.7 63607A JOINT SERVICE SHAI L. ARMS PROF FILE (ISSAP)	2	700			0		---
6.8 63101A COUNTERFIRE AND BARRIER REVENGE SYSTEMS	2				0		1-438

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DEPARTMENT OF THE ARMY  
 FY 1982 RDT + E PROGRAM  
 APPROPRIATION: 2040 A RESEARCH DEVELOPMENT TEST + EVAL. ARMY

EXHIBIT R-1  
 DATE: 15 JAN 1981

PROGRAM LINE ELEMENT NO	ITEM NOMENCLATURE	ACT	THOUSANDS OF DOLLARS			DESCRIPTIVE SUMMARY	PAGE NUMBER
			FY 1980	FY 1981	FY 1982		
69 63621A	COMBAT VEHICLE PROPULSION SYS	2	5,810	4,590	13,186	19,514 U	1-441
70 63626A	ADVANCED DIESEL ENGINE	2	14,200			U	---
71 63631A	CMBT VEH TURRET AND CHASSIS SUBSYS	2	4,024	5,018	0,014	13,442 U	1-448
72 63702A	ELECTRIC POWER SOURCES	2	3,700	3,916	5,177	3,260 U	1-452
73 63710A	NIGHT VISION ADVANCED DEVELOPMENT	2	13,801	20,719	29,306	34,208 U	1-456
74 63725A	REMOTELY PILODED VEHICLES/DRONES	2	3,320	4,905	4,343	7,333 U	1-465
75 63731A	MANPOWER AND PERSONNEL	2	3,085	3,065	4,675	6,360 U	1-470
76 63732A	COMBAT MEDICAL MATERIAL	2	111	132	191	225 U	1-475
77 63734A	COMBAT ENGINEERING SYSTEMS	2			269	258 U	1-478
78 63739A	HUMAN FACTORS IN TNS/OPER EFFECT	2	1,903	2,372	3,165	3,777 U	1-482
79 63742A	ADV ELECTRONIC DEVICES DEV	2	2,065		2,278	4,397 U	1-487
80 63743A	EDUCATION AND TRAINING	2	9,360	7,973	9,499	9,748 U	1-493
81 63744A	TRAINING SIMULATION	2	2,746	1,413	2,243	2,422 U	1-498
82 63747A	SOLDIER SUPPORT/SURVIVABILITY	2		3,276	3,181	3,307 U	1-502
83 63748A	ADV DEV OF AUTOMATIC TEST ED/SYS	2	1,430	8,493	14,631	9,665 U	1-507
84 63749A	TECHNICAL VULNERABILITY REDUCTION	2	2,850	2,011	1,274	3,840 U	1-514
85 63750A	DRUG AND VACCINE DEVELOPMENT	2	2,545	4,766	5,184	7,781 U	1-519
86 63751A	MEDICAL DEFENSE AGAINST CHEM WARFARE	2			3,000	3,000 U	1-523

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DEPARTMENT OF THE ARMY  
FY 1982 R D T + E PROGRAM

EXHIBIT R-1

APPROPRIATION: 2040 A RESEARCH DEVELOPMENT TEST + EVAL. ARMY

DATE: 15 JAN 1981

PROGRAM ELEMENT NUMBER	ITEM NOMENCLATURE	ACT	FY 1980	FY 1981	FY 1982	THOUSANDS OF DOLLARS	DESCRIPTIVE SUMMARY	
							FY 1983	C PAGE NUMBER
67 63752A DEMILITARIZATION CONCEPTS	2				4,000	7,000 U	1-527	
	ADVANCED TECHNOLOGY DIV/IMPLEMENT	140,164	166,516	207,556	324,991			
8G 63304A BMDO ADVANCED TECHNOLOGY	3	119,851	123,391	129,600	146,623 U	11-1		
89 63308A BALLISTIC ILSL DEF SYS TECH	3	120,814	144,855	215,826	269,143 U	11-6		
90 63735A WMMCS ARCHITECTURE	3	811				0	---	
	STRATEGIC PROGRAMS	241,479	268,246	345,516	409,766			
91 63215A JOINT SURVIVABILITY INVESTIGATIONS	4	600	645	918	1,130 U	11-11		
92 63303A SURF-TU-SURF MSL ROCKET SYS	4	70,203	790	3,057	16,705 U	11-15		
93 63407A SMART RANGE AIR DEF SFLF PROT WPN	4		6,842			0	11-21	
94 63516A ADVANCED ROCKET CONTROL SYSTEM	4		27,100			0	---	
95 63320A CURPS SUPPORT WEAPON SYSTEM	4	9,400	14,294	.0,000	73,764 U	11-22		
96 63536A AIMY STANDOFF JAMMER SUPPRESSION SYSTEM	4			4,000	6,000 U	11-27		
97 C3604A NUCLEAR MUNITIONS AND FADAC'S	4	1,677	1,724			0	11-30	
98 63607A JOINT SERVICE SMALL ARMS PROGRAM (JSSAP)	4			3,600	0	11-37		
99 63608A WEAPONS AND AMMUNITION	4	616			0	---		
100 63612A INF MANPORTABLE ANTI-ARMOR WPN SYS	4	2,000	19,731	52,972	105,993 U	11-42		
101 63615A LETHAL CHEMICAL MUNITIONS CONCEPTS	4	1,047	1,820	8,347	9,471 U	11-46		
102 63719A LANDMINE/BARRIER SYS	4	2,181	4,471	6,102	8,728 U	11-51		
103 63623A LANDMINE SYSTEMS	4	1,800			0	---		
104 63677A COMBAT SUPPORT MUNITIONS	4	2,815	2,334	6,275	14,029 U	11-55		
105 63628A FIELD ARTILLERY AMMO DEV	4	4,581	12,398	25,190	28,777 U	11-59		
106 63629A FIELD ARTILLERY CAVALRY SYSTEMS	4	3,646	5,652	2,074	15,556 U	11-70		

DEPARTMENT OF THE ARMY  
FY 1982 R D T + E PROGRAM

EXHIBIT R-1

APPROPRIATION: 2040 A RESEARCH DEVELOPMENT TEST + EVAL. ARMY

DATE: 15 JAN 1981

PROGRAM LINE ELEMENT NO NUMBER	ITEM NOMENCLATURE	THOUSANDS OF DOLLARS			DESCRIPTIVE SUMMARY		
		ACT	FY 1980	FY 1981	FY 1982	FY 1983	C
107	63632A ARMORED C1181 SPT VEHICLE FAMILY	4	3,700	2,224	103	0	11-75
108	63635A ADVANCED MIL II-PURPOSE ARMORED SYSTEM	4	-	-	20,199	6,955C	0
109	63705A PHYSICAL SECURITY	4	3,375	3,100	3,087	5,555C	0
110	63706A IDENTIFICATION-FRIEND OR FOE DEV	4	4,045	416	7,647	4,194	U
111	63707A COMMUNICATIONS DEVELOPMENT	4	6,703	4,075	6,451	3,370	U
112	63711A ACFT SURVEW SELF-PROTECTION	4	6,975	7,315	12,426	20,103	U
113	63712A MAPPING AND GEODESY	4	2,094	-	-	0	---
114	63713A JOINT TACTICAL INFO DISTRIBUTION SYSTEMS	4	-	20,477	19,067	41,233	U
115	63717A SPECIAL PURPOSE DETECTORS	4	-	-	-	5,64	U
116	63721A CHEMICAL DEFENSE MATERIEL CONCEPTS	4	14,088	21,231	20,476	16,056	U
117	63723A TACTICAL AUTOMATION	4	8,964	12,075	22,379	27,182	U
118	63726A COMBAT SUPPORT EQUIPMENT	4	7,528	6,032	6,924	8,303	U
119	63730A TACTICAL SURVEILLANCE SYSTEM	4	11,720	10,933	-	-	11-146
120	63737A ANTI-RADIATION MSI. COUNTER MEASURES	4	4,540	4,622	-	-	11-150
121	63740A DIV AIR DEFENSE COMD/CNTRL	4	3,000	14,085	13,378	12,562	U
122	63745A TAC ELECTROIC SPT MEASURE SYS	4	15,030	12,576	-	-	11-163
123	63746A SINGLE CHANNEL GRD/ABN RADIO SUB-SYS	4	20,475	15,714	15,526	9,135	U
124	63755A TAC ELEC C/M SYS	4	9,859	9,367	-	-	11-183
125	64201A AIRCRAFT AVIONICS	4	1,748	-	-	U	---
126	64202A AIRCRAFT WEAPONS	4	6,403	5,130	3,568	729	U
127	64203A AERIAL SCOUT	4	7,450	-	-	U	---
128	64204A AIR MOBILITY SUPPORT EQUIPMENT	4	250	1,187	3,064	3,958	U
129	64206A UH-60A BLACK HAWK	4	2,259	5,046	4,242	3,110	U
							11-208

DEPARTMENT OF THE ARMY  
FY 1982 R D I + E PROGRAM

APPROPRIATION: 2040 A RESEARCH DEVELOPMENT TEST + EVAL. ARMY

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PROGRAM NO	LINE ELEMENT NO	ITEM NOMENCLATURE	ACT	FY 1980	FY 1981	FY 1982	FY 1983	DEScriptive SUMMARY PAGE NUMBER
130	64227A	ADVANCED ATTACK HELICOPTER	4	176,036	172,916	94,027	0	II-212
131	64212A	COERA TOW	4	945	8,515	20,074	6,561	II-226
132	64213A	CH-47 MODERNIZATION	4	22,480	576	0	---	
133	64215A	UH-1 MODERNIZATION	4	200	0	0	0	II-231
134	64216A	AIRCRAFT PROPULSION SYSTEMS	4	1,098	0	0	0	II-232
135	64217A	SYNTHETIC FLIGHT TRAINING SYSTEMS	4	823	2,533	3,184	4,656	II-236
136	64218A	AIRDROP EQUIP DEVELOPMENT	4	0	25,939	39,373	45,876	II-240
137	64220A	ARMY HELICOPTER IMPROVEMENT PROG	4	0	0	0	13,200	II-245
138	64221A	SURVEILLANCE SYSTEM	4	0	0	0	0	II-254
139	64306A	STINGER	4	16,827	5,960	4,255	4,546	II-267
140	64307A	PATRIOT (CAN-D)	4	126,716	51,58	32,618	32,960	II-267
141	64308A	PRECISION LASER DESIGNATOR	4	3,600	0	0	0	---
142	64309A	ROI AND	4	11,299	12,756	0	0	II-293
143	64310A	HELIBORNE MISSILE HELLCIPE	4	61,000	45,002	24,791	19,671	II-300
144	64311A	PERSHING II	4	145,765	147,378	154,107	106,895	II-319
145	64313A	GRASS BLADE	4	30,215	36,125	21,342	10,603	II-333
146	64314A	GENERAL SUPPORT ROCKET SYS	4	0	64,393	36,038	17,330	11-336
147	64316A	FIRE AND FORGET HELLCIPE	4	0	12,110	27,723	61,117	II-354
148	64318A	DIVISION AIR DEFENSE GUN	4	25,719	65,263	36,629	0	II-355
149	64321A	JOINT TACTICAL FUSION PROGRAM	4	0	10,263	7,699	39,430	II-356
150	64601A	INFANTRY SUPPORT WEAPONS	4	0	4,546	3,976	6,183	II-361
151	64602A	WEAPONS AND AMMUNITION (H)	4	0	1,841	0	0	---
152	64603A	NUCLEAR MUNITIONS	4	0	23,077	11,379	0	II-370

DEPARTMENT OF THE ARMY  
FY 1982 RDT & EVAL JARMAI  
APPROPRIATION: 2040 A RESEARCH DEVELOPMENT TEST + EVAL. ARMY

EXHIBIT R-1

DATE: 15 JAN 1981

PROGRAM LINE ELEMENT NO NUMBER	ITEM NOMENCLATURE	ACT FY 1980	FY 1981	THOUSANDS OF DOLLARS		DESCRIPTIVE SUMMARY PAGE NUMBER	
				FY 1982	FY 1983 C		
153 64606A	EXPLOSIVE DEMOLITIONS (H)	4	600	0	0	---	
154 64608A	ARMY SHAL. ARMS PROGRAM	4	1,455	460	400 0	11-385	
155 64609A	COMBAT SUPPORT SYSTEMS	2	1,297	501	2,310	11-389	
156 64610A	LETHAL CHEMICAL MUNITIONS	4	1,050	2,219	1,583 0	11-393	
157 64612A	COUNTERRMINE AND BARRIERS	4	3,008	3,005	5,271 0	11-398	
158 64614A	FID. ARTY WPN/AMMO (155MM) (H)	4	6,211	0	0	---	
159 64616A	FIGHTING VEHICLE SYS	4	34,637	42,130	57,865	15,391 0	11-405
160 64617A	VEH RAPID FIRE 'IPN' SYSTEM-BUSMASTER	4	4,167	0	0	---	
161 64619A	LANDMINE WARFARE	4	8,742	9,572	8,310	9,949 0	11-420
162 64620A	LANK SYSTEMS	4	51,714	51,552	29,063	13,692 0	11-428
163 64621A	COPPERHEAD	4	9,085	6,061	3,362	2,077 0	11-441
164 64623A	VIFER	4	16,347	5,775	0	0	---
165 64624A	HIGH MOBILITY MULTI-PURPOSE VEHICLE	4	1,300	2,757	3,074	2,810 0	11-450
166 64626A	FIRE INTEGRATION SFT TEAM VEH	4	7,720	3,215	9,806	7,070 0	11-455
167 64628A	INDIRECT FIRE TRAINING MUNITIONS	4	1,061	513	1,356	1,471 0	11-460
168 64630A	TANK GUN COORDINATIVE DEVICE-MCII	4	40,236	67,061	74,337	42,219 0	11-464
169 64631A	FLD AF T. AMMO UNIT 1114	2	1,673	1,483	7,101 0	11-481	
170 64632A	105MM 17"X AMMUNITION	4	3,777	5,797	4,576 0	11-486	
171 64701A	FOR. FNC-1MFPNG DEV	4	5,413	7,724	9,152	13,816 0	11-1-1
172 64702A	JOINT TACTICAL INFO DISTRIBUTION SYSTEM	4	0	16,221	14,892 0	11-1-9	
173 64704A	UNAVIATED GROUND SUPPORTS	4	3,681	3,648	0	0	---
174 64705A	MORIAK INTEGRATED COMM AND NAVIGATION SYS	4	515	18,003	6,409 0	11-1-15	
175 64706A	RADIONICITAL MILITARY EQUIPMENT	4	270	312	147 0	11-1-19	

DEFENSE INSTITUTE OF THE ARMY  
FY 1982 RDT&T PROGRAM

APPROPRIATION: 2040 A RESEARCH DEVELOPMENT TEST & EVAL. APTN:

DATE: 1-1-1981

PROGRAM LINE ELEMENT NO. NUMBER	ITEM NOMENCLATURE	FY 1980		FY 1981		FY 1982		DESCRIPTION	PAGE NUMBER
		FY 1980	FY 1981	FY 1980	FY 1981	FY 1982			
176 64709A	IDENTIFICATION FRIEND OR FOE E)	4	900	3,010	2,173	5,242	0	111-24	
177 61710A	NIGHT VISION DEVICES	4	3,000	5,778	5,434	5,493	0	111-28	
178 64711A	AFFI SURVEY SELF-PROTECTION SYS	4	6,768	11,574	16,440	21,163	0	111-32	
179 64712A	TACTICAL CS SYSTEMS FOR INTELLIGENCE	4	3,984	10,682	9,137	19,378	0	111-47	
180 61713A	COMBAT FLYING, CLOTHING AND EQUIPMENT	4		2,550	3,593	4,267	0	111-61	
181 61714A	TACTICAL ELECTRICAL POWER SOURCES	4	4,400	5,322	2,172	1,636	0	111-66	
182 64716A	MAPPING AND GEODYSY	4	40			0	---		
183 61717A	GENERAL COMBAT SUPPORT	4	6,903	11,570	12,231	14,531	0	111-71	
184 64718A	PHYSICAL SECURITY	4	2,362	5,872	5,862	6,213	0	111-88	
185 64723A	SPECIAL PURPOSE DETECTORS	4		150	1,447	0	---		
186 64724A	PHOTOGRAPHIC & IMAGE MATERIAL	4	4,950	2,701	1,056	0	111-94		
187 61725A	CHIRP/DL DEFENSE MATERIAL	4		17,659	38,555	43,095	0	111-99	
188 64727A	COMMAND AND CONTROL	4	1,100	1,107	2,142	2,131	0	111-113	
189 64728A	COUNTER MORALE RADAR	4		1,100	15,356	16,560	0	111-113	
190 61730A	RFM TFR / PHOTOCOPIER UNITS	4	49,341	51,670	59,513	34,369	0	111-134	
191 64731A	COUNTING, BATTERY RADAR	4	3,147			0	---		
192 64740A	TACTICAL SURVEILLANCE SYSTEM	4	2,291	3,432			111-151		
193 64745A	TAC ELECTRO-OPTIC SURVEILLANCE SYS	4	12,128	9,280			111-155		
194 64746A	AUTOMATIC INF. SURVEILLANCE SYSTEMS	4				5,097	9,016	0	111-160
195 64748A	STANDBY TARNET ACQUISITION SYSTEM	4	6,015	55,575	71,735	79,740	0	111-163	
196 64750A	TAC LINE C/H SYS	4	2,516	2,277			111-176		
197 64752A	NAVSTAR GLOBAL POS. SYS. (SATL. L10)	4	1,455	1,455	0	0	---		



DEPARTMENT OF THE ARMY  
FY 1982 APPROPRIATION

APPROPRIATION: 2000 A RESEARCH DEVELOPMENT TEST & EVAL. FUND

EXHIBIT R-1

DATE: 1 JAN 1981

PROGRAM	LINE ELEMENT No.	ITEM NOMENCLATURE	ACT	FY 1990	FY 1981	FY 1982	FY 1983 C	COMPARISON	COMPLIANCE	DESCRIPTIVE SUMMARY	PAGE NUMBER
220	33126A	LONG-HAUL COMMUNICATIONS (DOS)	5	1,077	7,665	7,667	6,923	U	111-369		
221	33142A	SATCOM GROUND ENVIRONMENT	5	22,080			U	---			
222	33515A	WORLDWIDE MIL. CMD AND CONTROL SYSTEMS (WIMCS)	5				731	U	---		
223	33101A	COMMUNICATIONS SECURITY	5						111-373		
		INTELLIGENCE AND COMMUNICATIONS	32,504	37,472	55,28						
							92,525				
224	63718A	EW VULNERABILITY/SUSCEPTIBILITY	6	17,880	21,556					111-377	
225	63739A	NON SYSTEM TRAINING DEVICES	6	1,000	2,500	1,412	7,209	U	111-395		
226	63747A	SOLDIER SU PORT/SURVIVABILITY	6	2,159			U	---			
227	64126A	ACFT ENGINE COMPONENT IMPROVE T.O.G	6	8,700	8,540	11,842	12,223	U	111-400		
228	64713A	COMBAT FEELING, CLOTHING AND EQUIPMENT	6	1,613			U	---			
229	64715A	NON-SYSTEM INC. DEVICES ENGR	6	9,552	11,812	13,245	8,93	U	111-404		
230	641726A	NEUROLOGICAL EQUIPMENT SYSTEMS	6	6,072	2,687	2,145	2,223	U	111-414		
231	65102A	TRAFOC STUDIES AND ANALYSIS	6	2,200	1,525	1,705	2,008	U	111-422		
232	67261A	AVIATION ENGINEERING FLIGHT ACTIVITY	6	5,251	4,59	5,497	6,052	U	111-427		
233	65501A	KUAIJALIN MISSILE RANGE	6	98,141	13,532	143,765	153,916	U	111-431		
234	65702A	SUPPORT OF NEW OPNMENT TESTING	6	23,220	30,492	37,281	42,670	U	111-436		
235	65703A	MATERIAL SYSTEMS ANALYSIS	6	10,476	9,911	14,633	15,143	U	111-452		
236	65707A	SUPPORT OF OPERATIONAL TESTING	6	24,710			U	---			
237	65709A	EXPLOITATION OF FOREIGN ITEMS	6	3,742	1,542			111-457			
238	65712A	SUPPORT OF OPERATIONAL TESTING	6	11,613	30,016	14,768	52,921	U	111-462		
239	65715A	REFEFC SYSTMS MANAGEMENT COLLEGE	6		1,157	207	207	U	111-482		
240	65801A	PROGRAM MNG ACTIVITIES	6	48,206	52,108	61,631	65,530	U	111-486		
241	65802A	INTL COOPERATIVE RESEARCH & ID DEV	6	590	645	590	1,039	U	111-495		

## DEPARTMENT OF THE AIR FORCE

FY 1982 RDT + E PROGRAM

APPROPRIATION

2010 A RESEARCH DEVELOPMENT TEST + EVAL. AFW

EXHIBIT R-1

DATE: 15 JAN 1981

PROGRAM LINE ELEMENT NO. & ITEM NO.	ITEM IDENTIFICATION	ACI	FY 1982	FY 1983 C	DESCRIPTION
					SUMMARY PAGE NUMBER
242 65803A	TECHNICAL INFO ACTIVITIES	6	3,415	2,134	4,720 5,379 U 111-499
243 65904A	DATACOM MAINT/PAGE/TEST FACIL	6	16,126	11,711	7,547 310,215 U 111-505
244 15815A	IND MUNITIONS EFFECT/EXCLUSIVE SAFETY STAND	6	5,761	6,354	1,292 8,510 U 111-529
245 65806A	DDG HIGH ENERGY LASER SYSTEMS TEST FAC	6	14,350	42,137	26,901 U 111-539
246 65972A	PRODUCITIVITY INVESTMENT FUNDING	6	—	1,500	0 U ---
247 65954A	INSTL AUDIT/INSUL. SPT (R&D)	6	—	2,310	2,350 D 111-546
248 65957A	MGT HD (RESEARCH/DEVELOPMENT) DI FIR FIELD MISSION SUPPORT FT	5	26,301 47,451	30,642 5,177	39,646 7,317 41,807 U 111-548 P.O. 116
TOTAL	RESEARCH DEVELOPMENT TEST + EVAL. AFW	2,815,431	2,065,777	1,377,200	1,171,613

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DEPARTMENT OF THE ARMY  
RESEARCH, DEVELOPMENT, TEST AND EVALUATION, ARMY  
PERFORMER DISTRIBUTION  
(\$ in thousands)

## Section 3

## Appropriation: Research, Development, Test and Evaluation, Army

	FY 1980	FY 1981	Total Obligational Authority	FY 1982	FY 1983
1. For operation of installations of the reporting R&D Component	1,050,294	1,219,041	1,427,703	1,560,779	
Government operated					
Contractor operated					
For contracts directly in support of work actually performed at installations of the reporting R&D Component	59,068	67,100	77,001	87,976	
For work assigned to other Department of Defense activities	282,262	248,841	262,872	262,463	
For work assigned to activities of other Government agencies	146,211	161,869	184,307	212,256	
For work performed by industrial contractors ("profit" organizations)	21,100	26,025	19,951	22,711	
For work performed by educational institutions	1,199,216	1,232,573	1,480,980	1,964,743	
a. Designated Fed Contract Res Centers	24,470	30,243	33,278	36,629	
b. Other Institutions	43,164	50,713	62,827	72,350	
For work performed by other "non-profit" organizations					
a. Designated Fed Contract Res Centers	7,487	8,592	10,041	11,882	
b. Other Institutions	13,159	21,760	18,260	20,264	
Total Research, Development, Test and Evaluation, Army Appropriation	2,846,431	3,086,757	3,577,200	4,172,051	

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DEPARTMENT OF THE ARMY  
RESEARCH, DEVELOPMENT, TEST AND EVALUATION, ARMY  
INSTALLATION ANALYSIS - IN-HOUSE

Section 4

This installation analysis indicates the resources of dollars and manpower utilized by Army installations in the accomplishment of the in-house research, development, test and evaluation effort, including contractor operated installations, under the management control of the Army. Installations reported include both installations classified as research development, or test installations and research, development, or test units located at multi-mission installations. Funds being reported cover both direct costs and indirect or support costs. These funds are a part of project costs shown in the budget on the various projects. The amounts reflected under the category "R&E Funds" include funds received directly through command channels, and reimbursable R&E effort performed for other Army activities and other Department of Defense agencies. "All other funds" reflect the in-house effort at multi-mission installations for other than Research, Development, Test and Evaluation, Military Construction and Military Personnel costs. Military Personnel assigned to R&E activities and other military personnel located at the installation in support of non-R&E activities at multi-mission posts.

The personnel reflected includes spaces assigned and charged directly to the R&E appropriation as reflected in the personnel summary and spaces assigned to Army Industrial Fund installations operated with R&E funds. Contractor personnel shown are engaged in direct support or operation of Army installations.

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Section 4 (Contd)

**UNCLASSIFIED**

INSTALLATION ANALYSIS - IN-HOUSE

INDEX

Item No.	Installation	Page No.
Army Industrial Fund Installations		
1.	Aberdeen Proving Ground, Aberdeen, Maryland . . . . .	28
2.	Arment Research and Development Command, Dover, New Jersey . . . . .	28
3.	Army Material and Mechanics Research Center, Watertown, Massachusetts . . . . .	28
4.	Bennet Weapons Laboratory, Watervliet, New York . . . . .	29
5.	Harry Diamond Laboratories, Adelphi, Maryland . . . . .	29
6.	Missile Research and Development Command, Redstone Arsenal, Alabama . . . . .	29
Army Non-Industrial Fund Installations		
7.	Aberdeen Proving Ground, Aberdeen, Maryland . . . . .	30
8.	Aeronautical Research Laboratory, Ft. Rucker, Alabama . . . . .	30
9.	Air Defense Board, Ft. Bliss, Texas . . . . .	30
10.	Airborne Board, Ft. Bragg, North Carolina . . . . .	30
11.	Armor and Engineer Board, Ft. Knox, Kentucky . . . . .	31
12.	Army Biomedical Laboratory, Aberdeen, Maryland . . . . .	31
13.	Army Communicative Technical Office, Ft. Eustis, Virginia . . . . .	31
14.	Army Fugitive Flight Activity, Edwards Air Force Base, California . . . . .	32
15.	Army Institute of Dental Research, Washington, DC . . . . .	32
16.	Army Materiel Development & Readiness Command, Alexandria, Virginia . . . . .	32
17.	Army Materiel Development & Readiness Command, Program Managers, Various Locations . . . . .	33
18.	Army Research Office, Research Triangle Park, North Carolina . . . . .	33
19.	Atmospheric Science Laboratory, White Sands Missile Range, Las Cruces, New Mexico . . . . .	33
20.	Aviation Development Test Activity, Ft. Rucker, Alabama . . . . .	34
21.	Aviation Research and Development Command, St. Louis, Missouri . . . . .	34
22.	Aviation Test Board, Ft. Rucker, Alabama . . . . .	34

**UNCLASSIFIED**

Section 4 (Cont'd)

INSTALLATION ANALYSIS - IN-HOUSE

INDEX

Item No.	Installation	Page No.
Army Non-Industrial Fund Installations		
23.	Avionics Laboratory, Ft. Monmouth, New Jersey	35
26.	Ballistic Missile Defense Advanced Technology Center, Huntsville, Alabama	35
25.	Ballistic Missile Defense Program Office, Alexandria, Virginia	35
26.	Ballistic Missile Defense Systems Command, Huntsville, Alabama	36
27.	Gold Regions Research & Engineering Laboratory, Hanover, New Hampshire	36
28.	Gold Regions Test Center, Ft. Greely, Alaska	36
29.	Combined Arms Test Activity, Ft. Hood, Texas	37
30.	Communications and Electronics Board, Ft. Gordon, Georgia	37
31.	Communications Research and Development Command, Ft. Monmouth, New Jersey	37
32.	Computer Systems Command, Ft. Belvoir, Virginia	38
33.	Construction Engineering Research Laboratory, Champaign, Illinois	38
34.	Corps of Engineers RDT&E Headquarters Activities, Washington, DC	38
35.	Dugway Proving Ground, Dugway, Utah	39
36.	Electronic Proving Ground, Ft. Huachuca, Arizona	39
37.	Electronics Research and Development Command HQs, Adelphi, Maryland	39
38.	Electronics Research and Development Command, Ft. Monmouth, New Jersey	40
39.	Engineer Topographic Laboratory, Ft. Belvoir, Virginia	40
40.	Engineering Waterway Experimental Center, Vicksburg, Mississippi	40
41.	Field Artillery Board, Ft. Sill, Oklahoma	41
42.	Foreign Science and Technology Center, Charlottesville, Virginia	41
43.	Infantry Board, Ft. Benning, Georgia	41
44.	Institute of Surgical Research, Ft. Sam Houston, Texas	42
45.	Intelligence and Security Test Board, Ft. Huachuca, Arizona	42
46.	Kwajalein Missile Range, Marshall Islands	42
47.	Lettman Army Institute of Research, San Francisco, California	43
48.	Liaison Field Offices, Various Locations (ARI)	43
49.	Liaison Offices, Various Locations (DARCOM)	43

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Section 4 (Cont'd)

INSTALLATION ANALYSIS - IN-HOUSE

INDEX

**UNCLASSIFIED**

<u>Item No.</u>	<u>Installation</u>	<u>Page No.</u>
50.	Army Non-Industrial Fund Installations	
51.	Medical Bio-Engineering R&D Laboratory, Ft. Detrick, Maryland	46
52.	Medical R&D Command, Ft. Detrick, Maryland	44
53.	Medical Research Institute of Infectious Diseases, Ft. Detrick, Maryland	44
54.	Mobility Equipment R&D Command, Ft. Belvoir, Virginia	45
55.	Natick R&D Command, Natick, Massachusetts	45
56.	Night Vision and Electro-Optics Laboratory, Ft. Belvoir, Virginia	45
57.	Research Institute for Behavioral Sciences, Alexandria, Virginia	46
58.	Research Institute of Environmental Medicine, Natick, Massachusetts	46
59.	Research and Technology Laboratory, Moffat Field, California	46
60.	Signal Warfare Laboratory, Vint Hill Farms, Virginia	47
61.	Standardization Group, Australia	47
62.	Standardization Group, Canada	47
63.	Standardization Group, United Kingdom	48
64.	Tank Automotive R&D Command, Warren, Michigan	48
65.	Test and Evaluation Command Headquarters, Aberdeen, Maryland	49
66.	Tri-Service Tactical Communications Systems (TRI-TAC), Joint Test Element, Ft. Huachuca, Arizona	50
67.	Tri-Service Tactical Communications Systems (TRI-TAC), Ft. Monmouth, New Jersey	50
68.	Tropic Test Center, Panama Canal Zone, Panama	50
69.	Walter Reed Army Institute of Research, Washington, DC	50
70.	White Sands Missile Range, Las Cruces, New Mexico	51
71.	Yuma Proving Ground, Yuma, Arizona	51

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## Section 4 (Cont'd)

## INSTALLATION ANALYSIS - IN-HOUSE

Installation and Location Army Indus- trial Fund Installations 1. %	FY	TOA (\$ in Thousands)						Civil Service						Personnel (Man-Years)					
		RDTE Funds			All Other Funds 1/ Army			Mil. Pers.			RDTE			Civil Service Paid From Army Other			Contractor Paid From Paid From Other		
		RDTE	Funds	Other	Army	Other	Total	Mil.	Pers.	RDTE	Other	Total	RDTE	RDTE	Other	RDTE	RDTE	Other	Total
Aberdeen Proving Ground, Aber- deen, Maryland	80	53465	14776	1878	793	70912	1480	18	72410	1936	268	-	64	-	81	1	2320		
Arment Research and Development Command, New Jersey	81	54968	15300	1775	800	72843	1843	21	74707	2316	268	-	74	-	81	1	2706		
1.	82	68363	15600	1775	800	86538	1786	21	88345	2331	268	-	85	-	85	1	2685		
2.	83	73412	16100	1775	800	92087	1691	21	93799	2415	268	-	81	-	81	1	2765		
3.																			
Army Material and Mechanics Research Center, Watertown, Massa- chusetts	80	55418	35931	11478	-	102827	1516	238	104581	2823	660	-	-	-	83	13	3579		
	81	57594	33052	9910	-	100556	1822	-	102378	2641	660	-	-	-	86	-	3387		
	82	70888	32850	7700	-	111438	1555	-	112993	2765	660	-	-	-	74	-	3499		
	83	71687	32700	7700	-	118087	1148	397	119632	2765	660	-	-	-	55	19	3499		

1/ Exclusive of Military Personnel and Military Construction.

2/ ARRACOM AIF located on the Aberdeen installation, includes Ballistic Research Laboratory and Chemical Systems Laboratory.

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## Section 4 (Contd)

**UNCLASSIFIED**  
**INSTALLATION ANALYSIS - IN-HOUSE**

Installation and Location	FY	TOA (\$ in Thousands)						Civil Service Paid						PERSONNEL (Man-Years)					
		RDT&E Funds			All Other Funds			Maj. Pers.			From Army			Contractor Paid			In Pers.		
		Bureau	Army	Other	Bureau	Army	Other	RDT&E	Other	Total	RDT&E	Other	RDT&E	Other	RDT&E	Other	RDT&E	Other	
<b>Army Industrial Fund Installations</b>																			
4.								6814	110	-	6924	81	54	-	-	-	6	-	
Bonet Weapons Laboratory, Watervliet, New York	80	2202	4612	-	-	-	-	7664	127	-	7791	81	54	-	-	-	6	-	
	81	3164	4500	-	-	-	-	8948	126	-	9074	81	54	-	-	-	6	-	
	82	4148	4800	-	-	-	-	9203	125	-	9328	81	54	-	-	-	6	-	
	83	4403	4800	-	-	-	-										6	-	
<b>5.</b>																			
Harry Diamond Laboratories, Adelphi, Maryland	80	12770	26468	7830	10874	57942	37	55	58034	787	160	218	-	-	-	2	3	1170	
	81	14296	26291	7359	5134	51080	64	64	51208	886	168	119	-	-	-	3	3	1179	
	82	19256	32059	6545	5331	63191	63	63	63317	952	120	101	-	-	-	3	3	1179	
	83	19130	24930	7123	6365	57528	63	63	57654	898	144	131	-	-	-	3	3	1179	
<b>6.</b>																			
Missile Research and Development Command, Redstone Arsenal, Alabama	80	73501	6533	853	-	80887	2522	-	81409	1424	23	-	-	-	-	138	-	1585	
	81	73750	8132	3870	-	85752	2648	-	88400	1213	58	-	-	-	-	125	-	1396	
	82	60183	8860	1226	-	72269	2038	-	76407	1131	48	-	-	-	-	97	-	1276	
	83	53521	9932	2120	-	65573	1963	-	67536	1108	30	-	-	-	-	94	-	1232	
<b>Subtotal Army Industrial Fund</b>																			
Subtotal Army	80	210398	93556	22506	13902	360360	5976	311	346647	7440	1222	376	88	-	-	327	17	9470	
Industrial Fund	81	217594	90804	23467	8284	360149	6864	85	340998	7526	1265	277	84	-	-	324	4	9480	
	82	238118	100521	19881	8811	367951	5925	84	373960	7649	1207	259	35	-	-	282	4	9436	
	83	2,8407	96564	19528	10588	375087	5345	481	380913	7656	1213	289	35	-	-	256	23	9472	

1/ Exclusive of Military Personnel and Military Construction.

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## Section 4 (Contd)

**UNCLASSIFIED**  
**INSTALLATION ANALYSIS - IR-HOUSE**

Installation and Location	FY	TOA (\$ in Thousands)						Civil Services						Personnel (In thousands)						Contractor Paid			Contractor From		
		RDT&E Funds			All Other Funds 1/			Mil. Pers.			RDT&E Other			Army RDT&E			Contractor Paid			Contractor From			Personnel Paid		
		Budget	Bureau	Army	Other	Non RDT&E	Total	Sub- Total	RDT&E	Other	Total	RDT&E	Other	From RDT&E	From Other	From RDT&E	From Other	From RDT&E	From Other	From RDT&E	From Other	From RDT&E	From Other	From RDT&E	From Other
<i>7. Army Non-Industrial Fund Installations</i>																									
Aberdeen Proving Ground, Aberdeen, Maryland	80	51172	23994	197	67750	143113	12076	-	155189	1554	-	2194	82	223	805	-	4859	-	-	-	-	-	-	-	-
	81	86611	16339	50	76631	179631	13959	-	191590	1378	-	2487	192	462	812	-	5111	-	-	-	-	-	-	-	-
	82	91667	18118	80	80313	190178	13975	-	204153	1241	-	2457	264	484	812	-	5298	-	-	-	-	-	-	-	-
	83	98909	20102	65	89784	208860	13991	-	222851	1241	-	2457	278	523	812	-	5310	-	-	-	-	-	-	-	-
<i>8. Aeromedical Research Laboratory, Ft. Rucker, Alabama</i>																									
	80	2916	582	-	-	1	3499	1283	-	4782	74	-	-	-	-	-	77	-	151	-	-	-	-	-	-
	81	2957	-	-	-	-	2957	1480	-	4437	65	-	-	-	-	-	77	-	142	-	-	-	-	-	-
	82	3449	-	-	-	-	3449	1474	-	4923	65	-	-	-	-	-	77	-	142	-	-	-	-	-	-
	83	1687	-	-	-	-	3687	1671	-	5158	65	-	-	-	-	-	77	-	142	-	-	-	-	-	-
<i>9. Air Defense Board, Ft. Bliss, Texas</i>																									
	80	2391	1411	-	112	3914	1857	-	5771	85	-	-	-	-	-	-	117	-	202	-	-	-	-	-	-
	81	3043	92	-	309	3444	2138	-	5582	85	-	-	-	-	-	-	117	-	202	-	-	-	-	-	-
	82	2520	32	-	95	2647	2133	-	4780	85	-	-	-	-	-	-	117	-	202	-	-	-	-	-	-
	83	2766	77	-	35	2878	2130	-	5008	85	-	-	-	-	-	-	117	-	202	-	-	-	-	-	-
<i>10. Airborne Board, Ft. Bragg, North Carolina</i>																									
	80	1128	39	23	224	1414	1387	-	2801	40	-	-	-	-	-	-	87	-	127	-	-	-	-	-	-
	81	1190	-	-	149	1339	1777	-	3116	39	-	-	-	-	-	-	97	-	136	-	-	-	-	-	-
	82	1000	-	-	220	1220	1774	-	2994	40	-	-	-	-	-	-	97	-	137	-	-	-	-	-	-
	83	1000	-	-	220	1220	1771	-	2991	40	-	-	-	-	-	-	97	-	137	-	-	-	-	-	-

*1/ Exclusive of Military Personnel and Military Construction.*

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**Section 4 (Cont'd)**

**UNCLASSIFIED**  
**INSTALLATION ANALYSIS - IN-HOUSE**

Installation and Location	FY	TWA (\$ in Thousands)						Civil Service Personnel (000 Years)						Civil Service Personnel (000 Years)					
		ROTE Funds	Mil. Agent	Other Rongen	Other Army	All Funds	Mil. Pers.	Mil. Sub- Total	ROTE	Other	Total	Mil. Paid	Paid From Army	Paid From ROTE	Mil. Paid	Paid From Army	Paid From ROTE	Mil. Paid	Paid From Army
<b>Industrial Fund Installations</b>																			
I.1.																			
Army and Engineer Board, Ft. Knox, Kentucky	80	1581	3612	9	-	7202	3618	-	10820	102	-	-	-	-	-	227	-	379	-
Army Rep. Inv.	81	5607	9798	-	-	15405	6291	-	19696	102	-	-	-	-	-	216	-	336	-
	82	5661	6700	-	-	12361	4450	-	16711	85	-	-	-	-	-	238	-	323	-
	83	5686	565	-	-	6031	4365	-	10376	85	-	-	-	-	-	248	-	324	-
I.2.																			
Army Bio- medical Laboratory, Aberdeen, Maryland	80	6468	363	-	26	6857	1061	-	7898	109	-	-	-	-	-	62	-	171	-
	81	8169	290	-	10	8469	1232	-	9701	140	-	-	-	-	-	67	-	207	-
	82	8663	-	-	-	8463	1282	-	9745	163	-	-	-	-	-	72	-	245	-
	83	9747	-	-	-	9247	1277	-	10524	163	-	-	-	-	-	72	-	235	-
I.3.																			
Army Communicat- ive Technical Office, Ft. Castis, Virginia	80	353	-	-	-	353	23	-	376	11	-	-	-	-	-	2	-	13	-
	81	525	-	-	-	525	111	-	636	13	-	-	-	-	-	6	-	19	-
	82	500	-	-	-	500	69	-	569	13	-	-	-	-	-	4	-	17	-
	83	450	-	-	-	650	55	-	505	11	-	-	-	-	-	3	-	16	-

1/ Exclusive of Military Personnel and Military Construction.

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## Section 4 (Contd)

**UNCLASSIFIED**

## INSTALLATION ANALYSIS - IN-HOUSE

Installation and Location	FY	TOA (\$ in Thousands)						PERSONNEL (Man Years)						
		RTE Funds Right Bureau Army	Other Right Bureau Army	Other RTE Funds Total	A11 Other Funds Total	Sub- Total	Mil. Pers. RTE Other	Mil. Pers. RTE Other	From Army RTE	From Other RTE	Contract Paid From Other RTE	Contract Paid From Other RTE	To Food Work Other	Total
<b>Industrial Fund Installations</b>														
14.														
Army Engineer Flight Activi- ty, Edwards Air Force Base, 83 California	80	5294	616	-	179	6089	-	828	6917	100	-	7	55	162
	81	4591	600	-	90	5281	-	1145	6426	100	-	8	-	66
	82	5199	800	-	-	5999	-	1145	7144	100	-	8	-	66
	83	5759	750	-	-	6509	-	1145	7654	100	-	8	-	66
<b>15.</b>														
Army Institute of Dental Research, Washington, DC 83	80	1023	-	-	61	1084	1000	119	2427	22	2	-	60	30
	81	1213	-	-	-	1213	1160	392	2765	25	2	-	60	20
	82	1418	-	-	-	1418	1155	390	2963	25	2	-	60	20
	83	1483	-	-	-	1483	1151	388	3022	25	2	-	60	20
<b>16.</b>														
Army Materiel Development & Readiness Command, Alexandria, Virginia	80	4618	-	-	-	4618	588	-	5206	115	-	-	39	154
	81	5786	-	-	-	5786	676	-	6462	118	-	-	39	157
	82	5943	-	-	-	5943	676	-	6619	118	-	-	39	157
	83	6914	-	-	-	6914	676	-	7590	118	-	-	39	157

1/ Exclusive of Military Personnel and Military Construction.

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**UNCLASSIFIED****INSTALLATION ANALYSIS - IN-HOUSE**

## Section 4 (Contd)

Installation and Location	FY	TOA (\$ in Thousands)										PERSONNEL (Man-Years)										
		RDTE Funds			All Other Funds			Mil. Pers.			Civil Service Paid			Contractor Paid			Personnel Mil. Pers.					
		Mil.	Other	Army	Mil.	Other	POD	Mil.	Sub-	Total	RDTE	Other	Total	From	From	In	From	From	Other	RDTE	Funds Work	Other
Army Non-Indus-																						
trial Fund Installations																						
17.																						
Army Materiel	80	20661	4152	268	-	22081	1272	672	24025	285	8	32	-	-	-	85	45	455	455	455	455	
Development &	81	15237	1120	335	-	16692	1278	514	18484	224	7	36	-	-	-	74	28	369	369	369	369	
Readiness Com-	82	9467	1270	335	-	11072	1258	237	12567	161	4	-	-	-	-	72	12	249	249	249	249	
mand, Program	83	9605	1343	335	-	11283	1241	235	12759	158	4	-	-	-	-	71	12	245	245	245	245	
Managers, Vari-																						
ous Locations																						
18.																						
Army Research	80	4257	-	-	-	4257	50	-	4307	94	-	-	-	-	-	-	2	-	96	96	96	
Office, Re-	81	5412	-	-	-	5412	58	-	5470	94	-	-	-	-	-	-	2	-	96	96	96	
search Tri-	82	5900	-	-	-	5900	57	-	5957	94	-	-	-	-	-	-	2	-	96	96	96	
angle Park,	83	6370	-	-	-	6370	56	-	6426	94	-	-	-	-	-	-	2	-	96	96	96	
North Carolina																						
19.																						
Atmospheric	80	10094	269	231	9	10603	5342	-	15945	193	2	-	-	-	-	-	356	-	551	551	551	
Science Labor-	81	10900	150	100	-	11150	5937	-	17087	198	2	-	-	-	-	-	345	-	545	545	545	
atory, White	82	11500	-	-	-	11500	5941	-	17441	199	2	-	-	-	-	345	-	546	546	546		
Sands Missile	83	12100	-	-	-	12100	5947	-	18047	199	2	-	-	-	-	345	-	546	546	546		
Range, Las																						
Cruces, New																						
Mexico																						

1/ Exclusive of Military Personnel and Military Construction.

**UNCLASSIFIED**

#### Section 4 (Cont'd)

UNCLASSIFIED

INSTALLATION ANALYSIS - IN-HOUSE

Exclusive of Military Personnel and Military Construction.

UNCLASSIFIED

## Section 4 (Cont'd)

**UNCLASSIFIED**  
**INSTALLATION ANALYSIS - IN-HOUSE**

Installation and Location	FY	TOA (\$ in Thousands)										PERSONNEL (Other-Vans)					
		ROUTE Funds			All Other Funds			Mil. Funds			Pers.	Civil Service Paid			Contractor Paid		
		Mgmt	Buy-on	Army	Other	Army	Total	1/	Other	Total	RATE	From Army	From Other ROUTE	From Other ROUTE	From Other ROUTE	From Other ROUTE	From Other ROUTE
<u>23. Industrial installations</u>																	
Avionics Laboratory, Ft. Monmouth, New Jersey	80	11500	17984	255	-	31838	228	120	32186	138	1	-	22	-	15	8	384
	81	16648	19219	2000	-	37667	275	138	38080	341	2	-	23	-	16	8	190
	82	17409	19843	2500	-	39842	290	138	40270	343	2	-	24	-	17	8	394
	83	22364	19328	1500	-	43192	289	138	43619	343	2	-	20	-	17	8	390
<u>24. Ballistic Missile Defense, Advanced Technology Center, Huntsville, Alabama</u>																	
	80	5184	-	-	-	5184	198	-	5382	103	-	-	-	-	5	-	111
	81	5707	-	-	-	5707	233	-	5940	103	-	-	-	-	8	-	111
	82	6040	-	-	-	6040	229	-	6269	103	-	-	-	-	8	-	111
	83	3764	-	-	-	6766	275	-	6989	103	-	-	-	-	8	-	111
<u>25. Ballistic Missile Defense Program Office, Alexandria, Virginia</u>																	
	80	687	-	-	-	487	298	-	785	13	-	-	-	-	12	-	25
	81	600	-	-	-	600	150	-	950	13	-	-	-	-	12	-	25
	82	632	-	-	-	632	342	-	974	13	-	-	-	-	12	-	25
	83	673	-	-	-	673	338	-	1011	13	-	-	-	-	12	-	25

1/ Exclusive of Military Personnel and Military Construction.

**UNCLASSIFIED**

#### **Section 4 (Cont'd)**

UNCLASSIFIED

INSTALATION ANALYSIS - IN-HOUSE

Installation and Location	FY	Total (\$ in Thousands)			Personnel (Man-Years)		
		RDT&E Funds Budget	Other Funds	All Other Funds	Mil. Pers.	Civil Service Paid	Civil Service Contractor Paid
Army Non-Industrial Fund Installations	26.						
Balistic Miss ile Defense Systems Command	80	5808	-	-	5808	260	-
Huntsville, Alabama	81	8369	-	-	8269	306	-
	82	10472	-	-	10472	627	-
	83	11994	-	-	11994	618	-
Gold Regions Research & Engineering Laboratory,	80	3826	373	156	5136	9493	256
Hanover, New Hampshire	81	3981	600	200	5130	9915	297
	82	6580	850	220	5020	12570	296
	83	7130	930	240	5520	13820	292
Gold Regions Test Center, Fl. Greely, Alaska	80	4652	485	-	5137	4022	-
	81	5256	377	-	5631	4615	-
	82	5790	391	-	5681	4617	-
	83	5799	411	-	6210	4622	-

Exclusive of Military Personnel and Military Construction.

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**UNCLASSIFIED**

## Section 4 (Contd)

## INSTALLATION ANALYSIS - IN-HOUSE

Installation and Location <u>Army Non-Industrial Fund</u> <u>Installations</u>	FY	TOA (\$ in Thousands)						PERSONNEL (Man-Years)									
		RDT&E Funds			All Other Funds	Mil. Pers.	Mil. Sub- Total	Civil Service			Contractor						
		Bureau	Army	Other	Non	ROUTE	Other	Total	ROUTE	Other	ROUTE	From Other	Paid From ROUTE				
29.																	
Combined Arms	80	209	-	-	11720	11929	29	-	11958	1	-	-	129	2	-	132	
Test Activity,	81	676	-	-	15726	16402	69	-	16471	4	-	-	127	4	-	135	
Ft. Hood,	82	826	-	-	-	826	69	-	893	4	-	-	4	4	-	8	
Texas	83	826	-	-	-	826	69	-	893	4	-	-	4	-	-	8	
30.																	
Communications	80	1314	-	-	115	1439	989	-	2418	31	-	-	-	-	62	-	93
and Electro-	81	1251	-	-	180	1431	1135	-	2566	31	-	-	-	-	62	-	93
nics Board,	82	1430	-	-	330	1760	1281	-	3061	31	-	-	-	-	70	-	101
Ft. Gordon,	83	1072	-	-	180	1252	1281	-	2533	31	-	-	-	-	70	-	101
Georgia																	
31.																	
Communications	80	10906	10768	77	6863	88594	1163	132	89889	903	45	99	186	191	78	9	1511
Research and	81	106510	10433	237	6510	121690	1321	235	12246	937	44	106	282	203	77	13	1660
Development	82	112256	8548	173	6111	127086	1323	248	128657	950	42	101	311	205	77	14	1700
Command,	83	139029	8997	173	6336	156535	1338	248	156171	966	42	107	283	205	78	14	1675
Ft. Monmouth, New Jersey																	

1/ Exclusive of Military Personnel and Military Construction.

**UNCLASSIFIED**

**UNCLASSIFIED**

Section 4 (Contd)

INSTALLATION ANALYSIS - IN-HOUSE

Installation and Location	FY	TOA (\$ in Thousands)						PERSONNEL (in thousands)									
		RDTE Funds			Mil. Pers.			Civil Service			Contract Mil. Pers.						
		Mgmt	Other	Other	A11 Funds	Other Funds	Total	RDT	Other	Total	Paid	From Army	Paid	From Army	Paid	From Other	Total
<u>Army Non-In-Industrial Fund Installations</u>																	
32.																	
Computer Systems	80	740	-	-	-	-	740	174	-	914	18	-	-	-	7	-	25
Command, Ft. Belvoir, Virginia	81	936	-	-	-	-	936	205	-	1141	24	-	-	-	7	-	31
	82	802	-	-	-	-	802	171	-	973	21	-	-	-	6	-	27
	83	805	-	-	-	-	805	169	-	974	21	-	-	-	6	-	27
33.																	
Construction Engineering Research Laboratory, Champaign, Illinois	80	6222	5170	452	641	12485	73	-	12558	182	-	-	-	4	-	186	
	81	8100	4424	432	539	13495	127	-	13622	182	-	-	-	6	-	188	
	82	10142	3998	390	487	15017	168	-	15185	182	-	-	-	8	-	190	
	83	9245	4317	421	527	14510	209	-	14719	182	-	-	-	10	-	192	
34.																	
Corps of Engineers Headquarters Activities, Washington, DC	80	437	-	-	-	-	437	18	-	455	11	-	-	-	1	-	12
	81	609	-	-	-	-	609	21	-	630	11	-	-	-	1	-	12
	82	665	-	-	-	-	665	21	-	686	11	-	-	-	1	-	12
	83	666	-	-	-	-	666	21	-	687	11	-	-	-	1	-	12

1/ Exclusive of Military Personnel and Military Construction.

**UNCLASSIFIED**

## Section 4 (Cont'd)

**UNCLASSIFIED**  
**INSTALLATION ANALYSIS - IN-HOUSE**

Installation and location	FY	Army Non-Ind- ustrial Fund Installations	TOA (\$ in thousands)						PERSONNEL (in thousands)								
			RDTE Funds			Mil. Pers.			Civil Service Paid			Contractor Paid					
			Spent	Other	Other DOD	Mil. Pers.	Sub- Total	RDTE	Other	Total	From Army	From RDTE	From Other	Total			
15.																	
Highway	80	16138	7706	2095	293	26232	264	-	28873	624	11	-	5	10	176	-	826
Provding Ground	81	22638	9396	1050	8	31092	2686	-	35778	617	11	-	76	10	156	-	868
Ground,	82	27108	10383	1100	10	38601	2688	-	41289	617	11	-	253	10	156	-	1047
Proteev, Utah	83	31366	13570	1200	12	46146	2690	-	48836	617	11	-	337	10	156	-	1131
W.																	
Electronic	80	8882	5759	1053	211	15905	8512	2269	26686	31	38	45	171	15	567	151	1448
Provding Ground	81	11469	5705	1043	208	18425	9769	2604	30748	38	41	48	213	17	567	151	1215
Ft. Huachuca,	82	12232	5696	1062	208	19176	9773	2606	31555	38	41	48	213	7	567	151	1215
Arizona	83	12965	5722	1067	209	19943	9784	2608	32335	38	41	48	213	7	567	151	1215
37.																	
Electronics	80	9662	480	-	30	10172	517	-	10689	321	-	-	-	-	-	34	255
Research and Development	81	8783	525	-	-	9308	607	-	9915	222	-	-	-	-	-	35	257
Command Wqs., Adm. Phil., Ordnance	82	9893	525	-	-	10618	607	-	11075	222	-	-	-	-	-	35	257
	83	10101	525	-	-	10626	607	-	11241	222	-	-	-	-	-	35	257

17. Effective of Military Personnel and Military Construction.

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## Section 6 (Cont'd)

## INSTALLATION ANALYSIS - IN-HOUSE

Installation and Location FY Army Non-Indus- trial Fund Installations	TVA (\$ in Thousands)										PERSONNEL (in years)							
	RDT&E Funds Mgmt Bureau	Other Army BOD	All Funds / Funds		Sub- Total	RDT&E	Other	Total	Civil Service Paid		From Army RDT&E	Paid	From Other RDT&E	Contract Paid		Total		
			Mgmt	Bureau					From Other RDT&E	To Other RDT&E				From Other RDT&E	To Other RDT&E			
38.	Electronics Research and Development Command, Pt. Monmouth, New Jersey	80 81 82 83	94883 82369 74231 48217	20596 26450 25537 25285	2969 4974 5034 5030	6166 6630 6519 6765	124614 118523 111321 85297	601 745 745 745	-	125215 119268 112066 86042	475 492 505 502	23 24 23 21	123 129 121 128	50 40 45 50	-	40 43 43 43	711 728 737 744	
39.	Engineer Topo- graphic Lab- oratory, Pt. Belvoir, Virginia	80 81 82 83	5676 6215 7118 7215	2364 1963 2145 2375	2548 2718 2524 2550	- -	10588 10896 11787 12460	158 180 181 182	146 169 168 167	10892 11245 12136 12489	135 137 138 136	129 127 126 128	-	-	-	7 7 7 7	7 8 8 8	779 779 779 779
40.	Engineer Waterway Experimental Center, Vicksburg, Mississippi	80 81 82 83	4631 5393 7143 8066	5362 5615 6174 6200	7236 7085 7120 7200	1215 1144 1032 1100	18442 19257 21469 22566	91 106 105 104	-	18533 19363 21574 22670	250 256 255 255	203 208 207 206	224 228 228 227	23 38 43 41	2 2 2 2	5 5 5 5	107 137 150 136	

1/ Exclusive of Military Personnel and Military Construction.

**UNCLASSIFIED**

## Section 6 (Contd)

## UNCLASSIFIED

## INSTALATION ANALYSIS - IN-HOUSE

Installation and Location	FY	TOA (\$ in Thousands)										PERSONNEL (Man-Years)						Mil. Pers.				
		RDFE Funds			All Other Funds 1/ Don			Mil. Sub- Total			Pers., RDFE Other	GDFI Service Paid			Contractor Paid			Mil. Pers.				
		Bureau	Army	Other	Bureau	Army	Other	Total	RDFE	Other	Total	Mil.	Sub-	Total	RDFE	From Army	From Other	In Rate	From Other	In Rate	Funds Work	Other
<u>41. Industrial Fund Installations</u>																						
Field	80	1495	28	-	217	1740	2087	-	3827	37	-	-	-	-	-	-	-	131	-	168		
Artillery	81	1357	-	-	-	1157	2792	-	4149	37	-	-	-	-	-	-	-	152	-	189		
Board, F <sub>1</sub> , S <sub>1</sub> , T <sub>1</sub> , Oklahome	82	1644	-	-	-	1644	2785	-	4429	37	-	-	-	-	-	-	-	152	-	189		
83	1395	-	-	-	-	1395	2782	-	4177	37	-	-	-	-	-	-	-	152	-	189		
<u>42. Foreign Science and Technology Center, Charlottesville, Virginia</u>																						6
Foreign	80	81	-	-	-	81	25	-	106	5	-	-	-	-	-	-	-	1	-	1	-	6
Science and Technology	81	85	-	-	-	85	29	-	114	5	-	-	-	-	-	-	-	1	-	1	-	6
Center,	82	106	-	-	-	106	29	-	135	5	-	-	-	-	-	-	-	1	-	1	-	6
Charlottesville, Virginia	83	111	-	-	-	111	28	-	139	5	-	-	-	-	-	-	-	1	-	1	-	6
<u>43. Infantry Board, Ft. Benning, Georgia</u>																						169
Infantry	80	1829	-	-	-	558	2387	1809	-	4196	55	-	-	-	-	-	-	114	-	122	-	177
Board,	81	1803	-	-	-	154	1957	2236	-	4193	55	-	-	-	-	-	-	122	-	122	-	177
Ft. Benning,	82	1965	-	-	-	90	2035	2230	-	4265	55	-	-	-	-	-	-	122	-	122	-	177
Georgia	83	2126	-	-	-	-	3126	2227	-	6351	55	-	-	-	-	-	-	122	-	122	-	177

1/ Exclusive of Military Personnel and Military Construction.

UNCLASSIFIED

## Section 4 (Contd)

**UNCLASSIFIED**

## INSTALLATION ANALYSIS - IN-HOUSE

Installation and Location	FY	TOA (\$ in Thousands)										PERSONNEL (Thou-Years)										
		RDFE Funds					All Other Funds					Mil. Pers.					Civil Service Paid					Contractor Paid
		Mgmt	Burcas	Army	HOD	Total	Other	Mil.	Sub-	Total	RDFE	Other	Total	From Army	From Other	RDFE	From Army	From Other	RDFE	From Army	From Other	RDFE
<b>Army Non-Industrial Fund Installations</b>																						
44.	Institute of Surgical Research, Ft. Sam Houston, Texas	80	2268	-	-	714	2982	2506	-	5488	78	-	-	-	-	-	-	-	150	-	229	
		81	2962	-	-	250	3152	2892	-	6044	81	-	-	-	-	-	-	-	150	-	232	
		82	2629	-	-	275	2904	2879	-	5783	81	-	-	-	-	-	-	-	150	-	232	
		83	2839	-	-	275	3114	2870	-	5984	81	-	-	-	-	-	-	-	150	-	232	
45.	Intelligence and Security Test Board, Ft. Huachuca, Arizona	80	1258	29	-	290	1577	1230	-	2807	21	-	-	-	-	-	-	-	77	-	98	
		81	3144	10	-	349	3703	1222	-	4925	17	-	-	-	-	-	-	-	66	-	83	
		82	3354	10	-	500	3864	1277	-	5141	24	-	-	-	-	-	-	-	69	-	93	
		83	3761	11	-	1450	5222	1277	-	6499	24	-	-	-	-	-	-	-	69	-	93	
46.	Kwajalein Missile Range, Marshall Islands	80	61170	8875	11550	30	81625	754	-	82379	131	-	-	-	-	-	-	-	2617	32	3126	
		81	70820	7555	9355	80	87810	884	-	88694	131	-	-	-	-	-	-	-	2655	32	3131	
		82	77675	8840	12430	30	98975	868	-	98843	131	-	-	-	-	-	-	-	2651	32	3120	
		83	82586	9715	14480	-	106781	857	-	107638	131	-	-	-	-	-	-	-	2651	32	3120	

1 / Exclusive of Military Personnel and Military Construction.

**UNCLASSIFIED**

**UNCLASSIFIED**

## Section 4 (Contd)

## INSTALLATION ANALYSIS - IN-HOUSE

Installation and Location Army Non-Industrial Fund Installations	FY	TOA (\$ in Thousands)						PERSONNEL (Man-Years)					
		Mgmt Bureau	RDTE	Funds Other DOD	All Other Army	Other Funds	Sub- Total	Mil. Pers.	RDTE	Other	Total	Civil Service Paid	Contractor Paid
					RDTE	From	From	From	RDTE	From	From	RDTE	Other
47.					100	5966	2627	-	8593	107	-	41	-
Letterman Army	80	5137	729	-	150	6050	3046	-	9096	125	-	41	-
Institute of Research,	81	5500	400	-	250	7085	3032	-	10117	148	-	41	-
San Francisco,	82	6235	600	-	250	7835	3107	-	10942	148	-	41	-
California	83	6085	600	-								41	-
48.	Liaison Field Offices,	80	4777	-	-	4777	359	-	5136	124	-	-	17
Various Locations (ARI)	81	5863	-	-	5863	407	-	6270	124	-	-	17	-
82	5065	-	-	-	5965	410	-	6375	124	-	-	17	-
83	6074	-	-	-	6074	406	-	6480	124	-	-	17	-
49.	Liaison Offices, Various Locations (DARCOM)	80	734	-	-	534	-	46	580	15	-	-	4
		81	541	-	-	541	-	54	595	15	-	-	4
		82	783	-	-	783	-	54	817	15	-	-	4
		83	896	-	-	896	-	54	950	15	-	-	4

1/ Exclusive of Military Personnel and Military Construction.

**UNCLASSIFIED**

## Section 4 (Cont'd)

**UNCLASSIFIED**

INSTALLATION ANALYSIS - IN-HOUSE

Installation and Location	FY	TOA (\$ in Thousands)						PERSONNEL (Man-Years)									
		RDT&E Funds			All Other Funds			Mil. Pers.			Civil Service Paid			Garrison Paid			
		Sight Bureau	Army	DOD	Other DOD	Total	RDATE	Other	Total	From ARMY	From RDT&E	From Other	From RDT&E	From Other	Total		
<u>Army Non-Industrial Fund Installations</u>																	
50.																	
Medical Bio-Engineering	80	3819	243	27	4116	569	-	4685	94	-	-	-	34	-	128		
R&D Laboratory	81	4521	137	-	4658	656	-	5314	102	-	-	-	34	-	136		
Ft. Detrick,	82	5207	140	-	5347	653	-	6000	102	-	-	-	34	-	136		
Maryland	83	7034	140	-	7174	652	-	7826	102	-	-	-	34	-	136		
51.																	
Medical R&D Command, Ft.	80	2334	-	-	136	2470	957	-	3427	78	-	11	-	57	-	146	
Detrick,	81	4784	25	-	-	4809	1104	-	5913	81	-	11	-	57	-	149	
Maryland	82	4575	25	-	-	4600	1099	-	5699	81	-	11	-	57	-	149	
	83	5219	25	-	-	5244	1096	-	6340	81	-	11	-	57	-	149	
52.																	
Medical Research Institute of Infections Diseases,	80	9051	313	-	14	9378	5192	169	14739	191	-	-	5	-	311	10	517
Ft. Detrick,	81	9750	250	-	10	16010	5994	196	16200	199	-	-	5	-	311	10	525
Maryland	82	10802	275	-	13	11090	5967	195	17252	199	-	-	5	-	311	10	525
	83	11789	275	-	13	12077	5049	195	18221	199	-	-	5	-	311	10	525

1/ Exclusive of Military Personnel and Military Construction.

**UNCLASSIFIED**

## Section 4 (Cont'd)

**UNCLASSIFIED****INSTALLATION ANALYSIS - IN-HOUSE**

Installation and Location	FY	TOA (\$ in Thousands)						PERSONNEL (Man-Years)					
		RDTF Funds			Mil. Pers.			Civil Service			Contractor Mil. Pers.		
		Spent	Other	Other	All Other Funds	Sub- Total	RDTF	Other	Total	Paid From Army RDTF	Paid From Other RDTF	Paid From Other RDTF	Paid From Other RDTF
<b>Army Non Industrial Fund Installations</b>													
Mobility R&D	80	13809	6996	324	-	21129	1140	-	22269	750	3	433	-
Equipment R&D	81	14118	9560	300	-	23978	1309	-	25287	793	3	422	-
Command, Ft.	82	29741	7170	300	-	28211	1310	-	29521	883	-	335	-
Belvoir, Virginia	83	26006	7170	300	-	29876	1311	-	31187	883	-	335	-
<b>Sh.</b>													
Natick R&D Command	80	21528	1292	136	514	23670	1489	60	25219	784	11	18	-
Natick, Massachusetts	81	3623	1408	200	560	35691	1709	82	36812	768	5	13	-
Natick, Massachusetts	82	16147	1493	212	560	36612	1709	83	38204	769	5	12	-
Massachusetts	83	31180	1582	212	560	35534	1712	82	37328	768	5	13	-
<b>55.</b>													
Night vision and Electro-Optics Laboratory	80	1925	2751	685	5019	20980	480	-	21660	320	13	105	-
Belvoir, Virginia	81	14206	2300	500	5000	22006	551	-	22557	328	9	101	-
Belvoir, Virginia	82	17320	2300	500	5000	25129	552	-	25681	341	9	88	-
Belvoir, Virginia	83	21007	2300	500	5000	28807	552	-	29159	355	9	76	-

1/ Exclusive of Military personnel and Military Construction.

**UNCLASSIFIED**

**Section 4 (Contd)****INSTALLATION ANALYSIS - IN-HOUSE****UNCLASSIFIED**

Installation and Location	FY	TOA (\$ in Thousands)						Civil Service Personnel (Gross Years)											
		RDTPE Funds			All Other Funds			Mil. Pers.			Civil Service Personnel								
		Mgmt	Bureau	Army	Other	DOD	All Other Funds	Mil. Funds	Sub- Total	RDTPE	Other	Total	Contract Paid	From Paid	From Other	Contract Paid	From Paid	From Other	Contract Paid
<u>Army Non-Industrial Fund Installations</u>																			
56.																			
Research	80	7938	6	-	64	8008	295	-	8303	193	-	-	-	-	-	-	14	-	207
Institute for Behavioral Sciences,	81	9287	5	-	-	9292	344	-	9636	193	-	-	-	-	-	-	14	-	207
Alexandria, Virginia	82	9570	10	-	-	9580	340	-	9920	198	-	-	-	-	-	-	14	-	212
	83	9746	-	-	-	9746	335	-	10081	208	-	-	-	-	-	-	14	-	222
57.																			
Research	80	4092	94	17	3	4226	1331	-	5557	95	-	-	-	-	-	-	80	-	175
Institute of Environmental Medicine,	81	3656	60	25	-	3741	1536	-	5277	95	-	-	-	-	-	-	80	-	175
Natick, Massachusetts	82	4244	60	25	-	4329	1530	-	5859	95	-	-	-	-	-	-	80	-	175
	83	3058	60	25	-	3143	1525	-	4668	95	-	-	-	-	-	-	80	-	175
58.																			
Research and Technology Laboratory,	80	16033	4118	1816	20	21987	252	-	22239	536	-	-	-	-	-	-	17	-	553
Moffat Field, California	81	18971	4883	2049	-	25903	288	-	26191	526	-	-	-	-	-	-	17	-	543
	82	20295	3660	519	-	24474	289	-	24763	526	-	-	-	-	-	-	17	-	543
	83	21225	4026	571	-	25822	290	-	26112	527	-	-	-	-	-	-	17	-	544

1/ Exclusive of Military Personnel and Military Construction.

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## Section 6 (Contd)

**UNCLASSIFIED**

INSTALLATION ANALYSIS - IN-HOUSE

Installation and Location FY	Army Non In- dustrial Fund Installations	TOA (\$ in Thousands)						Civil Service						Personnel (Man-years)					
		RDT&E Funds			All Other Funds			Mil. Pers. Sub- Total			RDT&E Other			RDT&E Paid From Army Other			RDT&E Paid From Other RDT&E Work		
		Mgmt	Other	Other	RDT&E	Other	Total	RDT&E	Other	Total	RDT&E	Other	Total	RDT&E	Other	Total	RDT&E	Other	Total
59.	Signal Warfare	80	17296	1667	1701?	2776	38560	360	421	99330	70	33	8	138	24	28	301		
	Laboratory,	81	17035	6022	20964	2218	46239	512	496	45247	79	35	7	157	29	29	316		
60.	Vint Hill	82	19378	4172	28664	3842	66056	511	406	67063	79	35	7	202	29	29	381		
	Farms	83	17932	2128	33997	6564	78601	511	697	79609	79	35	7	233	29	29	417		
61.	Standard- ization Group,	80	16	-	-	16	29	-	45	-	-	-	-	-	-	-	2	-	2
	Australia	81	16	-	-	16	29	-	45	-	-	-	-	-	-	-	2	-	2
	Canada	82	36	-	-	36	29	-	63	-	-	-	-	-	-	-	2	-	2
		83	42	-	-	42	29	-	71	-	-	-	-	-	-	-	2	-	2

1/ Exclusive of Military Personnel and Military Construction.

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## Section 4 (Contd)

## UNCLASSIFIED

## INSTALLATION ANALYSIS - IN-HOUSE

Installation and Location	FY	Non- Army Non- Industrial Installations	62.	TOA (\$ in thousands)						CIVIL SERVICE						PERSONNEL (in thousands)					
				RDFE Funds			MIL. Pers.			CIVIL SERVICE			Paid			From			Paid		
				Mgmt	Bureau	Other	All	Other	Total	Mgmt	Sub-	Total	RDFE	Other	Total	RDFE	Other	Total	RDFE	Other	Total
Standard- ization Group, 81	80		-	-	-	-	-	-	120	55	-	175	1	-	-	-	-	-	-	-	-
Germany	82	164	-	-	-	-	164	56	-	220	1	-	-	-	-	-	-	-	3	-	4
	83	181	-	-	-	-	181	55	-	236	1	-	-	-	-	-	-	-	3	-	4
63.																					
Standard- ization Group, 81	80	1025	-	-	-	-	1025	156	-	1181	15	-	-	-	-	-	-	-	10	-	25
United Kingdom	82	1214	-	-	-	-	1214	180	-	1396	15	-	-	-	-	-	-	-	10	-	25
	83	1549	-	-	-	-	1549	180	-	1729	15	-	-	-	-	-	-	-	10	-	25
		1693	-	-	-	-	1693	179	-	1872	15	-	-	-	-	-	-	-	10	-	25
64.																					
Tank Auto- motive R&D	80	13040	11649	4323	-	-	18512	528	-	19040	401	112	-	-	-	-	-	-	35	48	
Command,	81	15683	1098	1320	-	-	18101	676	-	18777	461	49	-	-	-	-	-	-	30	49	
Warren,	82	17864	1365	363	-	-	19572	676	-	20248	487	35	-	-	-	-	-	-	39	61	
Michigan	83	18736	491	-	-	-	19227	676	-	19903	499	9	-	-	-	-	-	-	39	547	

1/ Exclusive of military personnel and military construction.

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## Section 4 (Contd)

**UNCLASSIFIED**

## INSTALLATION ANALYSIS - IN-HOUSE

Installation and Location	FY	TOA (\$ in Thousands)						PERSONNEL (Man-Years)						Contractor Mil. Pers.			
		RDT&E Funds			All Other Army Funds			Mil. Pers. Sub- Total			Civil Service Paid From Army RDT&E			Contractor Mil. Pers.			
		RDT&E	Other	Other	All	Other	Don	RDT&E	Other	Total	RDT&E	From Other RDT&E	From Other RDT&E	RDT&E Funds	Work Other	Total	
Army Non-Industrial Fund Installations	65.																
Test and Evaluation	80	17177	159	-	-	17336	72	1417	18825	390	-	1	38	-	5	94	528
Command Headquarters,	81	16288	159	-	-	16667	82	1627	18156	401	-	14	52	-	5	94	566
Aberdeen, Maryland	82	19105	-	-	-	19105	83	1628	20816	401	-	14	78	-	5	94	592
Tri-Service	83	19249	-	-	-	19249	82	1628	20959	401	-	14	78	-	5	94	592
Tactical Communications Systems (TAC), Joint Test Element, Ft. Huachuca, Arizona	66.																
	80	304	-	2188	-	3692	168	-	3860	54	-	-	-	-	11	-	65
	81	1592	-	2730	-	4222	193	-	4515	54	-	-	-	-	11	-	65
	82	16660	-	3018	-	6678	194	-	6872	54	-	-	-	-	11	-	65
	83	1781	-	3325	-	5106	193	-	5299	54	-	-	-	-	11	-	65

1/ Exclusive of Military Personnel and Military Construction.

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## Section 4 (Contd)

**UNCLASSIFIED**

INSTALLATION ANALYSIS - IN-HOUSE

Installation and location	FY	TOA (\$ in thousands)						CIVIL SERVICE						PERSONNEL (Plan-Year)						
		RDFE Funds			All Other Funds			Mil. Pers.			From Army RDFE			Paid From Other RDFE			Contractor Paid From Other RDFE			
		Mgmt	Bureau	Army	DOD	Other	Total	RDFE	Other	Total	RDFE	Other	Total	RDFE	Other	Total	RDFE	Other	Total	
<u>Army Non-Industrial Fund Installations</u>																				
67.	Tri-Service	80	6040	-	-	-	6040	312	-	6352	112	-	-	-	-	-	21	-	133	
	Tactical	81	7048	-	-	-	7048	358	-	7406	112	-	-	-	-	-	21	-	133	
	Communications	82	7266	-	-	-	7266	358	-	7624	112	-	-	-	-	-	21	-	133	
	Systems	83	7487	-	-	-	7487	359	-	7846	112	-	-	-	-	-	21	-	133	
	(TRI-TAC), Ft. Monmouth, New Jersey																			
68.	Tropic Test Center, Panama Canal Zone, Panama	80	2764	43	-	17	2824	1152	-	3976	77	1	1	1	1	1	2	77	-	163
		81	2923	48	-	55	3026	1322	-	4348	76	1	1	1	1	1	3	77	-	162
		82	3181	40	-	37	3238	1310	-	4568	77	1	1	1	1	1	2	76	-	165
		83	3474	41	-	34	3549	1298	-	4847	78	1	1	1	1	1	2	75	-	162
69.	Walter Reed Army Institute of Research, Washington, DC	80	17606	527	284	131	18568	7528	569	26645	400	-	24	28	-	461	34	937		
		81	25724	190	56	3	25973	8762	656	35391	453	-	25	25	-	454	34	994		
		82	26231	190	56	3	26480	8791	653	35924	476	-	25	25	-	458	34	1021		
		83	29137	190	56	3	29386	8764	652	38802	476	-	25	25	-	458	34	1021		

1/ Exclusive of Military Personnel and Military Construction.

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**Section 4 (Contd)**

**INSTALLATION ANALYSIS - IN-HOUSE**

Installation and Location Army Non-Indus- trial Fund Installations	FY	TOA (\$ in Thousands)						PERSONNEL (Man-Years)									
		RDT&E Funds			Mil. Pers.			Civil Service			Contractor Mil. Pers.						
		Mgmt	Other	Other Bureau	Other Army	Sub- Funds	Total	RDT&E	Other	Total	RDT&E	From Other	Total	Paid	From Other	Total	
White Sands	80	114314	20777	6064	9833	150968	12148	-	163116	2155	222	27	1043	-	810	-	4257
Missile Range, 81	139615	21996	6250	10240	178101	14041	-	192142	2228	230	27	1044	-	815	-	434	
Las Cruces,	82	159474	26588	7563	12372	205997	14128	-	220125	2229	230	27	1041	-	820	-	4347
New Mexico	83	168194	27186	7724	12613	215717	14227	-	229944	2196	227	27	1027	-	825	-	4302
<b>70.</b>																	
<b>71.</b>																	
Yuma Proving Ground, Yuma, Arizona	80	19869	12873	1334	2149	36225	5750	-	41975	823	-	10	110	-	183	-	1326
	81	29711	16100	1340	1913	49064	5643	-	54507	833	-	10	176	-	316	-	1335
	82	30839	15047	2640	3019	51345	5445	-	56790	833	-	10	200	-	316	-	1359
	83	35023	15973	2176	887	54059	5650	-	59509	833	-	10	200	-	316	-	1359
<b>Subtotal Army</b>	<b>80</b>	<b>778519</b>	<b>174570</b>	<b>63803</b>	<b>131728</b>	<b>1148620</b>	<b>105238</b>	<b>7526</b>	<b>1261384</b>	<b>15370</b>	<b>859</b>	<b>3696</b>	<b>4572</b>	<b>969</b>	<b>6731</b>	<b>491</b>	<b>32468</b>
<b>Non-Industrial</b>	<b>81</b>	<b>961121</b>	<b>183916</b>	<b>65364</b>	<b>143155</b>	<b>133356</b>	<b>119843</b>	<b>8815</b>	<b>1462214</b>	<b>15512</b>	<b>801</b>	<b>3815</b>	<b>5033</b>	<b>1177</b>	<b>6659</b>	<b>495</b>	<b>33492</b>
<b>Fund</b>	<b>82</b>	<b>1018290</b>	<b>185529</b>	<b>766664</b>	<b>135489</b>	<b>1415981</b>	<b>120444</b>	<b>8543</b>	<b>1544968</b>	<b>15484</b>	<b>776</b>	<b>3660</b>	<b>5416</b>	<b>1066</b>	<b>6701</b>	<b>480</b>	<b>33563</b>
	<b>83</b>	<b>1085129</b>	<b>185079</b>	<b>83187</b>	<b>145757</b>	<b>1499332</b>	<b>120266</b>	<b>8538</b>	<b>1628156</b>	<b>15468</b>	<b>746</b>	<b>3641</b>	<b>5499</b>	<b>1104</b>	<b>6790</b>	<b>480</b>	<b>33628</b>
<b>Total, in-House</b>	<b>80</b>	<b>988917</b>	<b>268126</b>	<b>86307</b>	<b>145630</b>	<b>1488980</b>	<b>111214</b>	<b>7837</b>	<b>1608031</b>	<b>22810</b>	<b>2081</b>	<b>3872</b>	<b>46660</b>	<b>969</b>	<b>7058</b>	<b>508</b>	<b>41938</b>
	<b>81</b>	<b>1158715</b>	<b>274720</b>	<b>88831</b>	<b>151439</b>	<b>1673705</b>	<b>126707</b>	<b>8900</b>	<b>1809312</b>	<b>23038</b>	<b>2066</b>	<b>4092</b>	<b>5117</b>	<b>1177</b>	<b>6983</b>	<b>499</b>	<b>42972</b>
	<b>82</b>	<b>1257017</b>	<b>286050</b>	<b>96565</b>	<b>144320</b>	<b>1783932</b>	<b>126369</b>	<b>8627</b>	<b>1918928</b>	<b>73133</b>	<b>1983</b>	<b>3899</b>	<b>5451</b>	<b>1066</b>	<b>6983</b>	<b>486</b>	<b>42999</b>
	<b>83</b>	<b>1311736</b>	<b>281643102715</b>	<b>156345</b>	<b>1874439</b>	<b>125611</b>	<b>9019</b>	<b>2009069</b>	<b>23124</b>	<b>1959</b>	<b>3930</b>	<b>5536</b>	<b>1106</b>	<b>6966</b>	<b>503</b>	<b>43100</b>	

**1/ Exclusive of Military Personnel and Military Construction.**

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**DEPARTMENT OF THE ARMY**  
**RESEARCH, DEVELOPMENT, TEST AND EVALUATION, ARMY**  
**ANALYSIS OF REIMBURSABLE PROGRAM**  
**(\$ in Thousands)**

Section 5

	FY 1980 ACTUAL	FY 1981 ESTIMATE	FY 1982 ESTIMATE
<u>Customer</u>			
Department of the Army . . . . .	486,289	420,128	426,622
<u>Other Department of Defense Components</u>			
Department of the Navy . . . . .	34,296	39,160	14,562
Department of the Air Force . . . . .	38,907	51,041	66,000
US Marine Corps . . . . .	4,496	10,255	5,642
Other Defense Agencies . . . . .	19,398	12,820	13,249
<u>Subtotal</u> . . . . .	583,386	533,804	526,075
<u>Activities Outside Department of Defense</u>			
Department of Commerce . . . . .	542	600	450
Department of Energy . . . . .	2,433	4,553	3,157
Department of Treasury . . . . .	433	400	200
Department of Health and Human Services . . . . .	380	375	700
Department of Transportation . . . . .	2,680	411	902
National Aeronautical and Space Administration . . . . .	871	1,353	1,689
Department of Interior . . . . .	403	620	710
Environmental Protection Agency . . . . .	435	100	150
Trust Funds . . . . .	436	321	225
Other . . . . .	6,448	7,078	6,667
Nonfederal Sources . . . . .	10,248	12,115	11,575
<u>Subtotal</u> . . . . .	25,309	28,496	26,425
<u>TOTAL</u> . . . . .	608,695	562,300	552,500

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Section 5 (Contd)

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ANALYSIS OF REIMBURSABLE PROGRAM

DESCRIPTION OF REIMBURSABLE WORK

A large percentage of the Research, Development, Test and Evaluation reimbursable program is for intra-Army (both inter/intra-appropriation) work or services performed under automatic reimbursement procedures. Research, Development, Test and Evaluation efforts also support requests received from other Federal and Nonfederal agencies on a reimbursable basis. Major areas of support include:

- a. Navy - Share of advancing blade concept helicopter high speed test program; Joint services small arms program; Joint cruise missile project; Fuel filter evaluation; Testing magazine protection enhancement program; Navy armo plate, decontamination-gas membrane; Armored combat vehicle technology support; Joint test element, Tri-Service Tactical Communications Systems Office; Mine neutralization studies; Surfzone transition analysis.
- b. Air Force - Effect of munitions on hardened structures; Installation security systems; 105mm blank rounds; Anti-aircraft blast dissemination technology; Aerosol displacement profile test; Environmental control unit; Joint microwave landing system; Advanced fence sensor development program; Support to MINUTEMAN II and III firing missions, Advanced ballistic reentry system tests; Space detection and tracking system; Modifications to the ALTAIR radar; Develop litter patient decontamination shower; Evaluation of Air Force clothing; Signature calibration and thermal control verification; Threat models for intercontinental ballistic missile/sea launched ballistic missile geometry simulations; Side looking airborne radar imagery; Radar tracking; Global positioning systems tests; Infrared flyover services; Air Force armo plate.
- c. Marine Corps - Support of the joint test element, Tri-Service Tactical Communications Systems Office; 100 gallon per minute fuel monitoring assembly; Tactical field fuel dispensing system; Solar power source program; 10 kilowatt generator engineering service; Mule program support; Medical field refrigerator modification; Studies of heat stress in carrier based personnel wearing chemical warfare clothing; Calibration in support of WEAPONER devices; Department of the Navy share of survey of special foreign activities; 5 inch semi-active laser.
- d. Other Defense Agencies:
  - (1) Defense Advanced Research Projects Agency - No tail rotor program; NAVSTAR ground positioning system; High altitude large optics program; Rail gun advanced indirect fire system.
  - (2) Defense Mapping Agency - Photogrammetric exploitation; Cartographic exploitation; Geodetic and geophysical support; Data base and data bank; Products and services.

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### Section 5 (Cont'd)

#### ANALYSIS OF REIMBURSABLE PROGRAM

- (3) Defense Nuclear Agency - Scientific services program; Nuclear weapons effects; SILO test program; Shallow buried structures test; Ground motion studies; Material modeling; Grant development; Federal Republic of Germany road cratering tests.
- e. Department of Energy - Conversion of cellulose to glucose; SEALED nuclear waste disposal program closure studies; Grout studies; Bochhole waste; Micro fracturing; Coal mine shafts; Food processing; Food waste recovery system.
- f. National Aeronautical and Space Administration - Tape scoring; Developmental testing of electronic warfare equipment; Space shuttle program.
- g. Nonfederal Sources - Canadian drone; Development of antitank 2 warhead for the Multiple Launched Rocket System in the Federal Republic of Germany; Treatment at the Institute of Surgical Research burn center; Fox tunnel, Yukon River bridge project; Passive seismic investigation; oil creek project.

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Section 6

DEPARTMENT OF THE ARMY  
RESEARCH, DEVELOPMENT, TEST AND EVALUATION, ARMY  
FEDERAL CONTRACT RESEARCH CENTERS

Federal Contract Research Centers (FCRCs) are those organizations primarily engaged in providing specialized technical and scientific effort necessary to supplement that available in the Army. The centers listed are those sponsored by the Department of Defense which provide technical and management services in the management of the Army's programs. These centers provide independent, specialized, technical and scientific capabilities to supplement that available within the Department of the Army.

FCRCs have been established to permit more organizational flexibility, and greater availability of technical and scientific personnel. These research centers possess unique skills and capabilities resulting from the development of highly specialized professional staff intimately acquainted with the many facets of the Army's mission. This capability results from long association and practical experience with the Army. The in-depth background provides the Army with a ready capability that cannot be immediately obtained elsewhere. Long association with the Department of Defense enables these centers to tailor these research centers to be compatible with Army interests, procedures and operational requirements. While the Army no longer sponsors an FCRC it will be necessary to continue research and development efforts at FCRCs sponsored by the Department of Defense and the other services. These research and development contracts provide timely and innovative products and techniques appropriate to current and long-range Army missions and plans.

The requested FY 1987 FCRC requirements reflect an increase of \$6.4 million when comparing FY 1982 to FY 1987.

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Section 6 (Contd)

FEDERAL CONTRACT RESEARCH CENTERS

The following summary identifies the estimated work, excluding subcontract effort, to be placed with each Federal Contract Research Center (FCRC) from the Research, Development, Test and Evaluation, Army appropriation and from the other Army appropriations.

SUMMARY BY APPROPRIATION AND PROGRAM ELEMENT  
(\$ in Thousands)

<u>FEDERAL CONTRACT RESEARCH CENTER/APPROPRIATION/PROGRAM ELEMENT</u>	<u>FY 1980 ACTUAL</u>	<u>FY 1981 ESTIMATE</u>	<u>FY 1982 ESTIMATE</u>	<u>FY 1983 ESTIMATE</u>
<u>AEROSPACE CORPORATION</u>				
Research, Development, Test and Evaluation, Army				
6.21.05.A Materials . . . . .	20	200	-	-
6.22.07.A Laser Weapons Technology . . . . .	25	80	100	100
6.26.18.A Ballistics Technology . . . . .	30	50	60	80
6.37.30.A Tactical Surveillance System . . . . .	582	408	482	528
6.37.45.A Tactical Electronic Surveillance Systems . . . . .	388	459	535	594
6.47.40.A Tactical Surveillance System . . . . .	485	357	428	462
6.47.45.A Tactical Electronic Surveillance Systems . . . . .	291	255	321	396
Total R&TE, Army . . . . .	1,821	1,809	1,926	2,160
Total Aerospace Corporation . . . . .	1,821	1,809	1,926	2,160

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Section 6 (Cont'd)

FEDERAL CONTRACT RESEARCH CENTERS

SUMMARY BY APPROPRIATION AND PROGRAM ELEMENT  
(\$ in Thousands)

FEDERAL CONTRACT RESEARCH CENTER/APPROPRIATION/PROGRAM ELEMENT

AEROSPACE CORPORATION (Continued)

Remarks: The expertise and facilities of Aerospace Corporation are required to support the Army in FY 1982-1983 as follows:

1. Laser Weapons Technology. Aerospace will provide experimental and theoretical analysis of pulse chemical lasers. Requirements cover areas of basic research and determination of rate data and theoretical analysis of pulse chemical lasers. The Directed Energy Directorate of the Army Missile Laboratory has responsibility for the development of High Energy Laser Weapon Systems for the Army which includes the pulse chemical laser work. Program requirements call for completion of demonstration model during the 1983-1985 timeframe; therefore, data is needed immediately. Aerospace has the capability required to perform this effort in an expeditious manner.
2. Ballistics Technology.
  - a. Aerospace Corporation has personnel who have developed and utilized computer models of the muzzle flow field. Additionally, at Aerospace there is a significant computational gasdynamics capability which has developed in response to Air Force requirements regarding analysis of rocket and space systems. The requested program will take advantage of the expertise available at Aerospace.
  - b. In FY 1980, the flow over a two-dimensional muzzle brake was computed using the three-dimensional, time dependent finite element code. Preliminary analysis of the geometry of a computationally acceptable three-dimensional brake was initiated. In FY 1981, computation of the prior year idealized three-dimensional brake will begin. Comparison with parallel experiments at Ballistics Research Laboratory will be performed. Consideration will begin on a geometry of a field muzzle brake. In FY 1982, computation of the flow through the first baffle chamber of a field muzzle brake will be conducted. In FY 1983 and outyears, computation of the flow through both the first and second chambers of a double baffle muzzle brake will be conducted. Muzzle brake efficiencies will be determined and compared with experiment. Consideration will be given to the computation of the muzzle blast propagation away from the region of the muzzle brake toward the crew members of the weapon. A scheme to couple the three-dimensional finite element code to a more efficient one or two-dimensional shock fitting model will be addressed. Following this, the problem of muzzle flow through a realistic geometry muzzle brake and propagation of the muzzle blast to the gun crew area will be finalized.

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Section 6 (Contd)

FEDERAL CONTRACT RESEARCH CENTERS

SUMMARY BY APPROPRIATION AND PROGRAM ELEMENT  
(\$ in Thousands)

FEDERAL CONTRACT RESEARCH CENTER/APPROPRIATION/PROGRAM ELEMENT

AEROSPACE CORPORATION (Continued)

3. Tactical Surveillance/Electronic Surveillance Systems. The Army has tactical requirements that current, proposed, and new space systems can satisfy if proper trade-off studies are performed and if equipment, communications, personnel and interfaces necessary to integrate the functions to these systems with other, more conventional systems are identified and acquired. Aerospace Corporation provides General Systems Engineering and Technical Direction (GSE/TD) support to the Air Force in the management of complex space and missile systems. This work encompasses a wide spectrum of technical activities from initiation of a system concept through development, testing, and operational evaluation. Specifically, activities include advanced mission planning, definition of system requirements and detailed breakdown of segment specifications and overall systems engineering. In FY 1982, Aerospace efforts will be provided as follows:

- a. General System Support will be provided. Studies, both conceptual and hardware oriented, will be identified, scoped and performed according to established milestones. Aerospace will help develop a comprehensive system concept defining the functions, equipment, communications, personnel and interfaces necessary to integrate space system support into ground force operations. Long range planning and briefing support, both personnel and material will be provided.
- b. General System Engineering/Technical Direction in support of simulation development and documentation and in support of other contractor efforts to be defined will be provided.
- c. Aerospace will modify and exercise several simulation programs to evaluate the support of potential advanced space systems to the tactical commander.
- d. Aerospace will provide technical support and perform system studies in support of Army field evaluations.
- e. Aerospace will provide technical support and perform system studies in support of Army evaluation on the need for Army unique space systems capabilities.

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## Section 6 (Contd)

## FEDERAL CONTRACT RESEARCH CENTERS

SUMMARY BY APPROPRIATION AND PROGRAM ELEMENT  
 (\$ in Thousands)

FEDERAL CONTRACT RESEARCH CENTER/APPROPRIATION/PROGRAM ELEMENT	FY 1980 ACTUAL	FY 1981 ESTIMATE	FY 1982 ESTIMATE	FY 1983 ESTIMATE
<b>LINCOLN LABORATORY, MASSACHUSETTS INSTITUTE OF TECHNOLOGY</b>				
Research, Development, Test and Evaluation, Army				
6.27.26.A Army Support to Defense Advanced Research Project Agency (DARPA) HOWLS . . . . .	1,500 *	-	-	-
6.33.04.A Ballistic Missile Defense Advanced Technology Program . . . . .	8,767	9,545	10,949	11,252
6.37.06.A IFF Developments (NATO) . . . . .	2,000 **	1,800 **	1,700 **	1,300 **
6.53.01.A Kwajalein Missile Range (KMR) . . . . .	3,535	3,785	4,560	4,760
6.58.04.A White Sands Missile Range (WSMR) . . . . .	1,015	1,000	1,200	1,300
Total R&D, Army . . . . .	13,317	14,330	16,709	17,312
Total R&D, Army Included in DARPA Ceiling . . . . .	1,500	-	-	-
Total R&D, Army Included in Air Force Ceiling . . . . .	2,000	1,800	1,700	1,300
Total Lincoln Laboratory, Massachusetts Institute of Technology . . . . .	16,817	16,130	18,409	18,612
Subcontract effort excluded from this amount . . . . .	11,146	15,459	16,619	17,600

\* Program funded by Army but supported with Advanced Research Project Agency (ARPA) ceiling.

\*\* Program funded by Army but supported with Air Force ceiling.

**UNCLASSIFIED**

**UNCLASSIFIED****Section 6 (Contd)****FEDERAL CONTRACT RESEARCH CENTERS****SUMMARY BY APPROPRIATION AND PROGRAM ELEMENT**  
**(\$ in Thousands)****FEDERAL CONTRACT RESEARCH CENTER/APROPRIATION/PROGRAM ELEMENT****LINCOLN LABORATORY, MASSACHUSETTS INSTITUTE OF TECHNOLOGY (Continued)****Remarks:**

Lincoln Laboratory technical effort is required to support the Army during FY 1982-1983 as follows:

1. Ballistic Missile Defense Advanced Technology Program: Lincoln Laboratory provides a unique research and development capability not duplicated in industry. They also provide an objective capability to evaluate industrial efforts. Lincoln Laboratory allows for high risk and high pay-off developments needed to advance the state-of-the-art. In prior years, Lincoln Laboratory has performed research effort in reentry discrimination, exoatmospheric discrimination and designation, large band digital signal processing, operation of the Army Optical Station at Kwajalein Missile Range, and requirements definition for advanced concepts in terminal and midcourse regimes. Effort will continue in the areas of discrimination techniques, signal processing, and advance radar components. Millimeter Wave instrumentation radar and monolithic MMIC receiver wave transceiver module efforts will be completed in FY 1982. Specific areas of effort include:

- a. Discrimination Technology: Discrimination technology effort includes work in reentry discrimination, bulk discrimination, exoatmospheric designation and discrimination engineering and radar data analysis and interpretation. Discrimination techniques utilizing millimeter wavelength radars and passive optics will be evaluated.
- b. Radar Technology: Radar technology effort includes work in millimeter-wave components, laser components, large bandwidth digital signal processing, and surface wave technology. It also includes the procurement and installation of a millimeter wave instrumentation radar at Kwajalein for data collection.
- c. Optics Technology: Optics technology effort includes: Operation of the Army Optical Station at Kwajalein Missile Range, which includes two passive optical sensors and one laser sensor, obtaining signature measurements on targets-of-opportunity and conducting handover experiments between these sensors and the radars at Kwajalein Missile Range; and reduction and analysis of Army Optical Station data.

**UNCLASSIFIED**

**UNCLASSIFIED**

Section 6 (Contd)

FEDERAL CONTRACT RESEARCH CENTERS

SUMMARY BY APPROPRIATION AND PROGRAM ELEMENT  
(\$ in Thousands)

FEDERAL CONTRACT RESEARCH CENTER/APPROPRIATION/PROGRAM ELEMENT

LINCOLN LABORATORY, MASSACHUSETTS INSTITUTE OF TECHNOLOGY (Continued)

- d. Terminal and Midcourse Defense Technology: Effort includes continuation of terminal and midcourse defense technology requirements definition for advanced concepts; with specific efforts in assessing the Low Altitude Defense Non-Nuclear Defense Requirements for endo defense and the Forward Acquisition System Requirements in the exo region.
2. Identification Friend-or-Foe (IFF) Developments (NATO). Lincoln Laboratory efforts are required for continuation of technical support to the US Army Electronics Research and Development Command related to the Army portion of the Joint Service Effort to design the NATO Identification System for both air defense and battlefield IFF applications. Previous analytic, experimental and crossboard efforts have resulted in a strawman design for the system which is the US baseline for negotiations with NATO.
3. Kwajalein Missile Range (KMR). Continued Lincoln Laboratory support is required as outlined below:
- a. The Kiernan Recovery Measurements Site radars which were developed by Lincoln Laboratory under Advanced Research Project's Agency sponsorship, and by direction of the Director, Defense Research and Engineering, were transferred to the Kwajalein Missile Range Directorate of the Ballistic Missile Defense Systems Command in 1968 to support the National Range mission.
- b. The US possesses no other comparable facility capable of collecting exatmospheric data and recording missile reentry phenomena than the Kiernan Recovery Measurement Site radar complex. The data collected by these instruments must be of the highest quality. High confidence in these test data leads to high confidence in missile development programs and ultimately in national strategic forces capabilities.

**UNCLASSIFIED**

**UNCLASSIFIED**

Section 6 (Contd)

FEDERAL CONTRACT RESEARCH CENTERS

SUMMARY BY APPROPRIATION AND PROGRAM ELEMENT  
(\$ in Thousands)

FEDERAL CONTRACT RESEARCH CENTER/APPROPRIATION/PROGRAM ELEMENT

LINCOLN LABORATORY, MASSACHUSETTS INSTITUTE OF TECHNOLOGY (Continued)

c. Lincoln Laboratory serves as Scientific Director of the Kierman Reentry Measurements Site at Kwajalein Missile Range, and they are considered predominant experts for this particular task. They provide the technical management of the overall Kierman Reentry Measurements Site instrumentation system which includes three very unique and complex radar sensors and their associated display, control, and recording equipments in support of mission operations. Additionally, they perform the offsite mission test planning, radar systems engineering, and data reduction and reporting.

d. Their overall efforts are pursuant to the objective of providing an integrated operation with multiple sensors whose total spectrum of capabilities will allow the collection of data for both strategic offensive and defensive weapon system development and which will function as an extremely flexible test bed for experiments on Advanced ballistic Missile system techniques. The instrumentation system at the Kierman Reentry Measurements Site is a continually evolving one due to the emphasis on using, in real time, the capabilities of the individual sensors to maximize the total effectiveness for data collection.

e. In summary, Lincoln Laboratory effort includes direction of all activities required to assure readiness and optimum coverage of a mission by the Kierman Reentry Measurements Site radars; also, upgrades to the radars to meet the changing and unique mission requirements generated by range user programs; to improve data quality and system reliability are responsibilities of Lincoln Laboratory system engineers and analysts. Kwajalein Missile Range does not have the in-house capability to perform this effort. If the effort were sought from other contractual sources, the expertise gained at Lincoln Laboratory and nurtured during the last 15 years at government expense would be sacrificed and an unacceptable degradation in the quality and efficiency of support provided testing programs would occur.

4. White Sands Missile Range (WSMR). Continued Lincoln Laboratory support is required for the High Energy Laser Systems Test Facility which is being developed in response to congressional direction that a single DOD Tri-service High Energy Laser Systems Test Facility be established at the White Sands Missile Range. The instrumentation for the High

**UNCLASSIFIED**

Section 6 (Cont'd)

**UNCLASSIFIED**

FEDERAL CONTRACT RESEARCH CENTERS

SUMMARY BY APPROPRIATION AND PROGRAM ELEMENT  
(\$ in Thousands)

FEDERAL CONTRACT RESEARCH CENTER/APPROPRIATION/PROGRAM ELEMENT

LINCOLN LABORATORY, MASSACHUSETTS INSTITUTE OF TECHNOLOGY (continued)

Energy Laser Systems Test Facility consists of sensing, data handling, data transmission, data processing, data analysis, command and control, beam diagnostics and communications equipment designed for integrated test and evaluation of High Energy Laser systems. The High Energy Laser Systems Test Facility in conjunction with the White Sands Missile Range Test Complex will provide a flexible capability for demonstration of High Energy Laser and other directed energy beam systems early in the development cycle. Integrated testing at White Sands Missile Range will permit cost effective capability evaluation and data base accumulation for accelerated development and reduced system life cycle costs. Lincoln Laboratory provides consulting services and technical expertise for education and analysis of High Energy Laser test requirements and in the conceptual design of High Energy Laser Systems Test Facility instrumentation.

**UNCLASSIFIED**

**UNCLASSIFIED**

## Section 6 (Contd)

## FEDERAL CONTRACT RESEARCH CENTERS

SUMMARY BY APPROPRIATION AND PROGRAM ELEMENT  
(\$ in Thousands)

FEDERAL CONTRACT RESEARCH CENTER/APPROPRIATION/PROGRAM ELEMENT	FY 1980 ACTUAL	FY 1981 ESTIMATE	FY 1982 ESTIMATE	FY 1983 ESTIMATE
<b>MITRE CORPORATION</b>				
Research, Development, Test and Evaluation, Army				
6.22.02.A Aircraft Avionics Technology . . . . .	360	300	360	360
6.26.03.A Large Calibre and Nuclear Technology . . . . .	-	-	290	330
6.27.01.A Communications Technology . . . . .	791	966	890	1,320
6.27.03.A Combat Surveillance Target Acquisition/ID. . . . .	44	-	300	318
6.37.07.A Communications Development . . . . .	550	732	112	-
6.37.13.A Communications Development (PLRS-TRIPS hybrid) . . . . .	-	-	600	880
6.37.45.A Tactical Electronic Support Systems . . . . .	-	480	480	480
6.37.49.A Tactical Vulnerability Reduction . . . . .	310	-	-	-
6.47.01.A Communications Engineering Development . . . . .	400	546	570	625
6.47.12.A Technical Data Systems Interoperability . . . . .	846	836	1,123	2,740
6.47.45.A Tactical FOT C&C Support (OFTA) . . . . .	210	300	470	505
6.47.50.A Tactical Electronic F/W Systems . . . . .	290	-	-	-
6.47.79.A JINTACCS . . . . .	<u>1,855</u>	<u>2,623</u>	<u>2,920</u>	<u>2,104</u>
Total RDTE, Army . . . . .	5,656	6,783	8,115	9,662

**UNCLASSIFIED**

## Section 6 (Cont'd)

**UNCLASSIFIED****FEDERAL CONTRACT RESEARCH CENTERS****SUMMARY BY APPROPRIATION AND PROGRAM ELEMENT  
(\$ in Thousands)**

<b>FEDERAL CONTRACT RESEARCH CENTER/APPROPRIATION/PROGRAM ELEMENT</b>	<b>FY 1980 ACTUAL</b>	<b>FY 1981</b>	<b>FY 1982</b>	<b>FY 1983</b>
		<b>ESTIMATE</b>	<b>ESTIMATE</b>	<b>ESTIMATE</b>
<b>MITRE CORPORATION (continued)</b>				
<b>Operations and Maintenance, Army</b>				
202399 GENTAC CCIS.	460	497	567	607
202399 USAF/EUR CCIS Implementation	950	1,100	1,200	1,200
208015 Army Command and Control Master Plan (AC2MP)	-	-	400	750
193111 US Army Communications Command (AC2MP & ABIC)	-	200	-	-
193111 US Army Communications Command (Transition Communication Planning)	-	-	90	210
393145 US Army Communications Command and Control Technical Support	630	675	857	995
195701 US Army Communications Command (ARBITS/WITS)	760	720	720	762
Total Operations and Maintenance, Army	2,800	3,192	3,814	4,519
Total MITRE Corporation	8,456	9,975	11,979	14,181

**UNCLASSIFIED**

**UNCLASSIFIED**

Section 6 (Contd)

FEDERAL CONTRACT RESEARCH CENTERS

SUMMARY BY APPROPRIATION AND PROGRAM ELEMENT

(\$ in Thousands)

FEDERAL CONTRACT RESEARCH CENTER APPROPRIATION/PROGRAM ELEMENT

MITRE CORPORATION (Continued)

Remarks: MITRE Corporation expertise and technical support is required by the Army as follows:

1. Aircraft Avionics Technology.

- a. MITRE will assist the US Army Aviation Research and Development Command in defining helicopter C<sup>3</sup> system requirements and in developing a methodology for identifying alternative configurations which satisfy the requirements for the post 1990 timeframe. At present, there is no methodology for determining future C<sup>3</sup> system architectural needs for Army aviation. Such a methodology is needed to provide a tie between the operational needs and processes and the hardware and software systems that support those needs. The ongoing MITRE effort provides such a methodology and can lead to the development of an overall C<sup>3</sup> system architecture for aviation.
- b. In general, the MITRE method produces a detailed description of operational processes, time factors and information exchanges within and external to aviation elements. With this, capability gaps and system deficiencies can be exposed, and comparisons between current systems and proposed alternatives can be carried out. A synthesis of future C<sup>3</sup> architecture can then be carried out using advanced technology to redress system deficiencies and to meet future requirements.
- c. During FY 1980, MITRE conducted work which began defining the time and event sequences and the information flow sequences of a typical anti-armor mission. The FY 1981 effort completed the anti-armor mission and extended the analysis across the other Army aircraft missions, i.e., logistics, reconnaissance, medevac. From this data base the methodology for defining the aviation C<sup>3</sup> architecture was developed and candidate architectures were described.
- d. During FY 1982 and FY 1983 MITRE will concentrate on system architecture investigations, computer simulation, and laboratory breadboard of testbed elements as delineated in the following task areas:

**UNCLASSIFIED**

**UNCLASSIFIED**

**Section 6 (Cont'd)**

**FEDERAL CONTRACT RESEARCH CENTERS**

**SUMMARY BY APPROPRIATION AND PROGRAM ELEMENT**  
**(\$ in Thousands)**

**FEDERAL CONTRACT RESEARCH CENTER/APPROPRIATION/PROGRAM ELEMENT**

**MITRE CORPORATION** (Continued)

(1) Development of Aviation Architecture. During FY 1982, the methodology development would be completed for determining the relationship between the mission operational needs and the future C3 architecture. This methodology is needed not only for the development of future candidate architectures but also to help identify the technology areas of thrusts that should be pursued by the US Army Aviation Research and Development Command. Candidate aviation C3 concepts such as the Executive Control Subordinate System. The architecture of the Executive Control Subordinate System is currently in the definition stage and information generated by the aviation architecture would better define the interfaces between aviation elements and other Executive Control Subordinate System elements.

(2) C<sup>3</sup> Technology Assessment. During FY 1982 and FY 1983 this effort would be conducted in conjunction with the development of a candidate architecture. It is necessary to conduct this task so as to ensure the technology of 1990-2000, which would be used by the elements of the Executive Control Subordinate System architecture, would also be incorporated into the aviation architecture. Recent technology surveys will be reviewed with focus on addressing any C3 short falls of the current helicopter C<sup>3</sup> architecture and to meet the architectural requirements of the 1990's. Technologies would be identified with maximum payoff and minimum risk.

2. Large Calibre and Nuclear Technology. MITRE will provide analytical, modeling and general technical support to the Large Calibre Weapon Systems Laboratory, of the US Army Armament Research and Development Command, to assist the Large Calibre Weapons Systems Laboratory in the evaluation and development of advanced weapon systems such as Enhanced Self Propelled Artillery Weapons System. Other programs requiring assistance include guided projectiles and Improved Sensing Munitions. MITRE, for example, will provide a survivability module for the Enhanced Self Propelled Artillery Weapons System computer model used by the Large Calibre Weapon Systems Laboratory in order to investigate the advantages and disadvantages of tactics such as "shoot and scoot" and the dispersed battery: this may include the modification of MITRE's Stochastic Counter Artillery Model, if appropriate. In support of the Large Calibre Weapon Systems Laboratory guided projectile and Improved Sensing Munitions program, MITRE will provide and articulate the Command, Control, Communications, Intelligence data base for operational performance evaluations, as well as provide analytical support concerning the Command, Control, Communications, Intelligence issues as they develop.

**UNCLASSIFIED**

**UNCLASSIFIED**

Section 6 (Contd)

FEDERAL CONTRACT RESEARCH CENTERS

SUMMARY BY APPROPRIATION AND PROGRAM ELEMENT  
(\$ in thousands)

FEDERAL CONTRACT RESEARCH CENTER/APPROPRIATION/PROGRAM ELEMENT

MITRE CORPORATION (Continued)

3. Communications Technology. MITRE will provide system research, analysis, and engineering support as follows:

a. They will provide specialist system design and engineering support to the Communications Research and Development Command in the identification, definition, and analysis of advanced system concepts and information handling techniques to include consideration of measures for assuring continuity of operations and acceptable levels of system survivability. The MITRE work will provide the basis for follow-on exploratory development and/or advanced development programs pursued to experimentally verify the feasibility and adequacy of proposed C3 system structures. During FY 1980, MITRE's work involved the initial identification and outline description of promising Army tactical C3 system structures, potential information handling techniques, and advanced user input-output facilities. This initial effort will provide a foundation for the follow-on work on the definition of advanced system concepts.

b. They will provide specialist technical support to the Communications Research and Development Command in the application of automatic data processing to tactical spectrum management and engineering; specific efforts will include development of compatibility and vulnerability analysis models to address emissions in the electromagnetic part of the spectrum with special emphasis on the analysis of spread spectrum system impact. In 1979, the Communications Research and Development Command working in conjunction with the Electromagnetic Compatibility Analysis Center initiated an exploratory development program to consider alternative system solutions for the effective management of the Army's use of the frequency spectrum. The total program will address decentralization of spectrum management and engineering functions, integration of terrestrial and satellite management, evolution and integration with the TRI-TAC tactical communications control facilities, interoperability with the future Army all source analysis center, generation and electronic distribution of communications-Electronics Operating Instructions, and interaction with Joint, NATO, and allied systems. A modern spectrum management system is vital to the effective deployment and operation of the future automated Army command, control, and communications systems. Initial MITRE effort involved the definition and analysis of a functional description of an integrated benchmark Automated Battlefield Spectrum Management and Engineering System. The information aspect of the temporal, physical, electrical and procedural interfaces have been determined. Tables were prepared to portray the information required by the Spectrum Management System from other tactical systems.

**UNCLASSIFIED**

Section 6 (Cont'd)

FEDERAL CONTRACT RESEARCH CENTERS

SUMMARY BY APPROPRIATION AND PROGRAM ELEMENT

FEDERAL CONTRACT RESEARCH CENTER/APPROPRIATION/PROGRAM ELEMENT

**UNCLASSIFIED**

MITRE CORPORATION (Cont'd)

c. MITRE personnel will participate as members of the Battlefield Information Distribution System working group in the detailed planning for and the conduct of the various phases of the corps level experiment. They will work with the US Army Training and Doctrine Command and US Army Materiel Development and Readiness Command representatives to determine the benefits of applying Battlefield Information Distribution System technology to closed loop systems which require data distribution capabilities. The Communications Research and Development Command, acting for the US Army Materiel Development and Readiness Command and in conjunction with the US Army Training and Doctrine Command, is presently involved in a program to refine the specifications and establish the potential for a digital data communications system for Army use on the battlefield. Specific applications include the transfer to digital data from sensors to command center computers and among division and Corps command center computers to demonstrate tactical operational concepts such as the Corps Information Flow concept, expected to be implemented in the mid to late 1980's. This project was initiated in order to determine whether certain critical operational needs, difficult to satisfy by the classic point-to-point network, could be served more efficiently by an all-digital network. Implementation of intrusion proof fiber optic cable into the Battlefield Information Distribution System tested experiment will be investigated. MITRE has been assisting the Communications Research and Development Command by active participation in this corps experiment working group sessions. This included preparation of draft plans for Phase I and II of the experiment which have been successfully implemented. Phase III which is currently underway and the preparation of a long range tentative plan to cover FY 1981-1985 activity. In addition, MITRE has assisted the Communications Research and Development Command in an evaluation and assessment of Phase I and II results as a collateral task. MITRE provides on call, assessments of the characteristics and capabilities of various hardware candidates for investigation in concert with the corps experiment. This type tasking includes assistance to the Communications Research and Development Command in the preparation of Statements of Work, proposal evaluation and contract performance monitoring for procurement actions associated with the experiment, including the low cost Packet Radio Effort. Prior to FY 1980, work was being done under the title, "Tactical Army Distribution (TADS) Experiment". The project number remained the same. In FY 1980 MITRE produced a 5 year Master Plan for the Fort Bragg Experiment. This documentation provides detailed technical areas for investigation, and first cut funding requirements that will allow Army decision makers to select scenarios and topics that

**UNCLASSIFIED**

**UNCLASSIFIED**

## Section 6 (Cont'd)

## FEDERAL CONTRACT RESEARCH CENTERS

SUMMARY BY APPROPRIATION AND PROGRAM ELEMENT  
(\$ in Thousands)

## FEDERAL CONTRACT RESEARCH CENTER/APPROPRIATION/PROGRAM ELEMENT

## MITRE CORPORATION (Continued)

are of most interest. MITRE is also preparing an overall Communications Research and Development Command C<sup>3</sup> White Paper to more clearly focus on the Army C3 problem and their potential solution. The main thrust of MITRE efforts during FY 1982-1983 will be the preparation of specific plans for the utilization and evaluation of the corps level testbed resources at Fort Bragg including a master long range schedule. MITRE personnel will work closely with the Communications Research and Development Command, US Army Material Development and Readiness Command, US Army Training and Doctrine Command, XVIII Airborne Corps, and Defense Advanced Research Project Agency representatives in the preparation of these documents. In addition, MITRE will determine a feasible method of integrating associated developmental testing (e.g., Field Artillery, Army Air Defense, Beta and HELBAT) with the corps level experiment.

d. MITRE will investigate the conceptual design of the Army Battlefield Information Distribution System network using results from FY 1979/1980 basic research in the area of development of a set of computer programs as a vehicle for development of algorithms for large, dynamic data networks. These algorithms, design principles/concepts will be investigated with the Network Management Algorithm Vehicle to investigate the performance of the Battlefield Information Distribution System network operating under a large set of control architectures. MITRE will also investigate generic system level architectures such as slotted/non-slotted, synchronous/asynchronous TDMA, as well as control concepts for fully distributed, partially distributed and centralized networks to establish a basis for trade-off analysis. Realistic military scenarios will be used as a framework for the Battlefield Information Distribution System network design concepts. MITRE will implement the investigation with emphasis on general areas such as evaluation of a variety of distributed and routing / low control algorithms for Army tactical environment; determination of the required frequency of automatic network reconfiguration actions in mobile tactical scenario; evaluation of the performance of different channel access modes (e.g., pure ALOHA, carrier sense, reservation, etc.) and of single versus multiple channel operation (including various data rates), in tactical mobile operations in typical terrain; and, quantification of the tradeoff between increased computational capability of networks elements and decreased overhead traffic levels between network elements. The main thrust of MITRE efforts in FY 1982 and FY 1983 will be completion of an investigation of the hardware and software aspects of digital network management and control via analysis, and computer modeling/simulation. MITRE will provide technical management support, program formulation, planning, coordination with related activities, systems analysis, and engineering. This includes assistance with the VHSTC task with academic research tasks related to Network Management, and the low Cost Packet Radio task.

**UNCLASSIFIED**

**UNCLASSIFIED**

Section 6. (Cont'd)

FEDERAL CONTRACT RESEARCH CENTERS

SUMMARY BY APPROPRIATION AND PROGRAM ELEMENT  
(\$ in Thousands)

FEDERAL CONTRACT RESEARCH CENTER/APPROPRIATION/PROGRAM ELEMENT

MITRE CORPORATION (Continued)

a. Combat Surveillance Target Acquisition/Identification. MITRE support is required for analysis and research to provide detailed requirements and concepts for advanced Intelligence, Surveillance, Target Acquisition Systems and to guide Combat Surveillance and Target Acquisition developmental efforts for the next ten to twenty years.

a. The principal purposes of this task are to summarize the factors that drive Army Intelligence, Surveillance, Target Acquisition requirements, and identify the major issues which impact the formulation of an Intelligence, Surveillance, Target Acquisition architecture. The timeframe considered shall be the latter 1980's.

b. The contractor shall generally describe planned Army tactics for fighting a central European war, considering both conventional and tactical nuclear conflicts. Korean and Middle Eastern scenarios shall be addressed secondarily, from the viewpoint of how tactics in these areas would differ from those planned for Europe.

c. The contractor shall summarize the Army's Intelligence, Surveillance, Target Acquisition requirements, relating them to the planned tactics. The Intelligence, Surveillance, Target Acquisition needs described shall include not only the sensing functions, but also the links to distribute Intelligence, Surveillance, Target Acquisition information. Variations in scenarios or tactics which strongly affect the Intelligence, Surveillance, Target Acquisition requirements shall be identified. Coordination of this effort shall be accomplished with the US Army Training and Doctrine Headquarters and appropriate user agencies.

d. Intelligence, Surveillance, Target Acquisition equipments that are presently fielded or are in development by the services shall be catalogued and briefly described. The developing agency shall be identified, and the performance of each system shall be summarized. The contractor shall briefly assess the adequacy of these equipments to meet Army Intelligence, Surveillance, Target Acquisition requirements, and shall identify the major issues requiring resolution where a clear assessment is not possible. Recommendations for follow-on analyses to resolve these issues shall be provided. A framework shall be developed for investigations into relevant physical sciences and technology, including the current technology base and forecasts for its expansion.

**UNCLASSIFIED**

Section 6 (Contd)

FEDERAL CONTRACT RESEARCH CENTERS

SUMMARY BY APPROPRIATION AND PROGRAM ELEMENT  
(\$ in Thousands)

FEDERAL CONTRACT RESEARCH CENTER/APPROPRIATION/PROGRAM ELEMENT

MITRE CORPORATION (Continued)

e. Results of the above efforts shall be furnished in a report, which shall include a thorough bibliography of recent (past 5-10 years) publications on the topics described above. Additionally, the contractor shall compile a reference library of documents for delivery to the government, comprising the major recent publications in the areas of Intelligence, Surveillance, Target Acquisition architecture requirements, design, and analysis.

5. Communications Development. MITRE efforts are required for support of the Local Distribution Fiber Optic Cable System. The long-term objective of the Army fiber optic communications program is to field substantially improved cable systems as part of an overall modernization of tactical communications systems. Fiber optic technology promises much higher capacity as well as increased reliability and mobility relative to conventional metallic cable. In addition, Electro Magnetic Interference, power Frequency Interference, and crosstalk are essentially eliminated. There is also the potential that the increased reliability and reduced logistic requirements will result in significant economies on a life cycle cost basis. As an extension of the long haul program, MITRE has begun work on a Local Distribution Fiber Optic Cable System for the Army during 4th Quarter FY 1980. This effort was initiated under a temporary arrangement through Air Force. The Army plans to move the local distribution program into 6.4 by 1982. In order to meet this deadline an immediate 6.3 program must be initiated and MITRE support is essential to meeting this schedule. The MITRE role in this project will be that of System Research and Planning. In this role MITRE will provide both general and specific systems research on advanced fiber optic systems. This assistance will include the areas of application analysis, design tradeoff and life cycle cost analysis, specification and evaluation of optical components, preparation of demonstration systems and field support. Specific tasks to be performed by MITRE include local distribution cable analysis, design tradeoff and life cycle cost analysis, specification of optical components, preparation of demonstration system, field support of demonstrations and evaluation.

**UNCLASSIFIED**

**UNCLASSIFIED**

Section 6 (Contd)

FEDERAL CONTRACT RESEARCH CENTERS

SUMMARY BY APPROPRIATION AND PROGRAM ELEMENT  
(\$ in Thousands)

FEDERAL CONTRACT RESEARCH CENTER/APPROPRIATION/PROGRAM ELEMENT

MITRE CORPORATION (Continued)

6. Communications Development (Position Location Reporting System - Joint Tactical Information Distribution System Hybrid). The Army has initiated the Position Location Reporting System - Joint Tactical Information Distribution System Hybrid program to provide a data distribution and position location system for the Army battlefield in the late 1980's. A Letter of Agreement and an Operational and Organizational Concept have been approved on this System. A Study Report provided by the Secretary of Defense approval and outlined an accelerated acquisition activity based upon product improving already developed Joint Tactical Information Distribution System and Position Location Reporting System terminals. MITRE was the hybrid system engineer during the conceptual development of the Hybrid System. MITRE's support to the hybrid in prior years was primarily associated with the Joint Tactical Information Distribution System portion of the hybrid. In carrying out this task MITRE's efforts also were concerned with the overall Hybrid design and testbed planning. MITRE helped to define the testbed configuration and contractor roles in the testbed. MITRE provided technical inputs to the position Location Reporting System net management design approach and simulation. The effort in FY 1982 and FY 1983 will expand on the previous effort to include increased emphasis on the whole Hybrid System rather than just the Joint Tactical Information Distribution System portion which is covered under Army's Joint Tactical Information Distribution System Joint Project Office Project. MITRE's previous involvement in the Hybrid conceptual work has provided it with an extensive background knowledge of the Army's operational requirements and it is in a good position to translate these into technical design requirements. In addition, information needed to perform this function is sensitive from a planning and funding standpoint. This type of information can be released to MITRE because its Federal Contract Research Center status.

7. Tactical Electronic Support Systems. MITRE efforts are needed for conduct of research aimed at improving Intelligence, Surveillance, Target Acquisition/Electronic Warfare processing techniques to support the Army tactical commander's needs for battlefield management, operations planning, enemy intentions, and targeting information. MITRE will conduct research, analysis, and experiments involving the automated processing, fusion, and display of mover, shooter, and emitter data for the purpose of developing efficient, automated techniques for identifying and locating critical nodes. The application of mover and emitter processing schemes in being or under development will be assessed for incorporation into the Technical Control and Analysis Center (Division) as a component of an interim All Source Analysis System. In addition, MITRE will design and support acquisition and installation of the Intelligence Processing Laboratory. The Intelligence Processing Laboratory will provide researchers with the facilities for conducting research and experimentation aimed at improving Intelligence, surveillance, Target Acquisition/Electronic Warfare processing techniques.

**UNCLASSIFIED**

**UNCLASSIFIED**

## Section 6 (Contd)

FEDERAL CONTRACT RESEARCH CENTERSSUMMARY BY APPROPRIATION AND PROGRAM ELEMENT  
(\$ in Thousands)FEDERAL CONTRACT RESEARCH CENTER/APPROPRIATION/PROGRAM ELEMENTMITRE CORPORATION (Continued)

8. Communications Engineering Development. MITRE technical support is required for the Fiber Optics Transmission System (Long Haul) full-scale development program, to include system engineering, contract monitoring, economic analysis, reliability and maintainability analysis, and fiber optic component and interface equipment evaluation. In addition, MITRE will continue to conduct analyses and long-range planning toward the definition of cost effective application of fiber optic technology. The MITRE role is that of System Engineer for the fiber optic development effort. In this role, MITRE will continue to provide both general and specific system engineering activity assistance, some of which is a continuation of those tasks initiated in FY 1980. This assistance will include continuation of the design trade-off studies, life cycle cost analysis in support of the design trade-off studies, component evaluation, and nuclear hardening effects study. A multi-discipline support group capable of executing both technical and economical studies is required. They should be conducted by professional people experienced in military operations, communications and fiber optics. Such support is not available within this command due to current limitation in manpower. MITRE personnel have unique qualifications for the program planning and implementation of an engineering development program for Army long haul fiber optic programs. MITRE has been involved in the development of several fiber optic demonstration systems for potential military application under an Air Force sponsored Fiber Optics Technology Applications program.

9. Tactical Data Systems Interoperability. MITRE technical support is required as follows:

- a. MITRE will provide system engineering and transition analysis support for the Army's work to specify the current baseline and near-term/mid-term transition of the Army Command, Control, and Communications systems employed at all Army tactical echelons. The Center for Systems Engineering and Integration at the Communications R&D Command serves as the Army's tactical Command, Control, and Communications System Engineer. The goal of the Center is to establish a cohesive, well-engineered, affordable, and evolutionary system design which effectively integrates the component fire control, air defense, Electronic Warfare/Intelligence, command information, combat service support, and communications facilities into a single overall system to provide for effective command and control of Army tactical forces at all echelons. A balanced near-term and far-term system design and engineering program is required to achieve those objectives; i.e., exploratory development efforts are

**UNCLASSIFIED**

**UNCLASSIFIED**

## Section 6 (Cont'd)

FEDERAL CONTRACT RESEARCH CENTERSSUMMARY BY APPROPRIATION AND PROGRAM ELEMENT  
(\$ in Thousands)FEDERAL CONTRACT RESEARCH CENTER/APPROPRIATION/PROGRAM ELEMENTMITRE CORPORATION (continued)

required to derive and analyze the future goal-type system designs toward which the Army should evolve and near-term oriented system engineering efforts are required to address the integration of the equipments and systems that are now in development and production. MITRE will provide specialist system design and engineering support to the Communications R&D Command (Center for Systems Engineering and Integration) in the development of force element oriented system level specifications which technically define the Army's Command, Control, and Communications systems at each major organizational element of the Army; e.g., an Infantry Division. The work will include transition analyses to determine the best means for introducing the emerging new equipments and subsystems into the Army's tactical Command, Control, and Communications systems and the definition of the interoperability standards needed to integrate the tactical Command, Control, and Communications facilities into a single cohesive system and to interface the Army systems with the appropriate systems of the other military services and the US allies. MITRE support for the Center for Systems Engineering and Integration system engineering work associated with the design and integration of the Army's Position Location Reporting System - Joint Tactical Information Distribution System Hybrid System will be continued during FY 1982 and FY 1983.

b. MITRE will provide system engineering and transition analysis support for the Army's work to define a near-term and follow-on full implementation for the Army's Executive Control Subordinate System Concept for distribution of information among the functional elements of the Army's Command, Control, and Communications system. In FY 1980, the Army's System Architect, established an Executive Control Subordinate System Concept as their architecture for identifying the information needs/flows that must be accommodated between the Army Control Systems (i.e., fire control, air defense, combat service support, operations, and Electronic Warfare/Intelligence) and between the Commander and each of those Control Systems. The Center for Systems Engineering and Integration has the responsibility to determine the extent to which the identified information flow requirements can be satisfied in the near-term, the technical solution for the near-term, and an evolutionary or transitional approach to eventually provide for the full satisfaction of those objectives. In FY 1982-1983, MITRE will provide specialist system design, analysis, and engineering support to the Communications R&D Command (Center for Systems Engineering and Integration) in the development of the system design that will be established to satisfy the Executive Control

**UNCLASSIFIED**

**UNCLASSIFIED**

## Section 6 (Contd)

FEDERAL CONTRACT RESEARCH CENTERSSUMMARY BY APPROPRIATION AND PROGRAM ELEMENT  
(\$ in Thousands)FEDERAL CONTRACT RESEARCH CENTER/APPROPRIATION/PROGRAM ELEMENT**MITRE CORPORATION (Continued)**

Subordinate System requirements. This effort will involve the definition of a near-term solution which can be fielded early through use of the Army's Tactical Computer System and Tactical Computer Terminal equipments. The effort will include specification of interfaces, software expansion/modification, and system level procedures needed for near term fielding; follow-on efforts will be devoted to determining a proposed far-term implementation for the Executive Control Subordinate System concept and the transition path which will be followed to achieve that goal.

10. Tactical Electronic Warfare Intelligence Command and Control Support (BETA). In 1977 the BETA project was established by OSD to demonstrate the feasibility and utility of prompt coupling of target acquisition sensor data into tactical combat situation displays and fire power systems. In June 1980 Congress requested that the role of the BETA Joint Project Office be expanded to take on the development of operational system prototype derivatives of the BETA Test Bed, namely, the Army's All Source Analysis System and the Air Force's Tactical Fusion Division. The goal is to have the implementation of the operational systems under contract by October 1981, with an Initial Operational Capability planned for June 1984. To meet the requirements imposed by Congress and OSD, a program involving four parallel efforts is being developed. For FY 1981 the objectives are as follows:

- a. To complete the evaluation of the initial Test Bed capability and identify improvements that should be included both in further evaluation of the Test Bed and in the procurement of the operational systems.
- b. To complete the procurement cycle for acquiring an implementation contractor for the operational system, beginning with the preparation of a Request for Proposal and ending with a contract award by 1 October 1982.
- c. To utilize the BETA Test Bed in a COMIS Command Post Execution in June 1981 and a European Field Training Execution in September 1981 for the purpose of learning to use the capabilities in an operational environment and identifying additional future improvements for the operational systems.

**UNCLASSIFIED**

**UNCLASSIFIED**

## Section 6 (Cont'd)

FEDERAL CONTRACT RESEARCH CENTERSSUMMARY APPROPRIATION AND PROGRAM ELEMENT  
(\$ in Thousands)FEDERAL CONTRACT RESEARCH CENTER/APPROPRIATION/PROGRAM ELEMENTMITRE CORPORATION (Continued)

d. To generate a dynamic tactical simulation capability for supporting Command Post Executions and for evaluating system capabilities.

MITRE will work in direct support of the Director, BETA/A11 Source Analysis System/Tactical Fusion Division Joint Project Office. Work plans and changes will be coordinated with the Director to assure they are matched to current priorities. MITRE personnel may be collocated with other Joint Project Office personnel at selected government facilities. MITRE will support the Joint Project Office in carrying out the four parallel efforts of its program which are BETA Test Bed Evaluation, Acquisition of A11 Source Analysis System/Tactical Fusion Division Operational Capabilities, Test Bed Demonstrations and Evaluations and Tactical Simulator Development.

11. Joint Interoperability of Tactical and Control Systems. MITRE technical support is required in two areas as follows:

a. MITRE will provide system research, analysis, planning, engineering, and technical management support to the Army Test Unit in all phases of its mission in support of the Joint Interoperability of Tactical and Control Systems testing program. This support will include requirements analysis, analysis and evaluation of current and programmed capabilities to insure maximum effectiveness and interoperability configuration management, and test planning, conduct, data collection and analysis. MITRE will support the Army Test Unit by:

- (1) Assisting in the preparation for and support of the Joint Interoperability of Tactical and Control Systems Compatibility and Interface test objectives, plans, procedures, conduct, data collection and analysis of Air Operations, Operations Control, and Fire Support Test Segments.
- (2) Providing the technical support necessary to insure timely execution and completion of assigned Joint Interoperability of Tactical and Control Systems Compatibility and Interface testing to include support to Intelligence and Air Operations Operational Effectiveness Demonstration.

**UNCLASSIFIED**

**UNCLASSIFIED**

Section 6 (Contd)

FEDERAL CONTRACT RESEARCH CENTERS

SUMMARY BY APPROPRIATION AND PROGRAM ELEMENT  
(\$ in Thousands)

FEDERAL CONTRACT RESEARCH CENTER/APPROPRIATION/PROGRAM ELEMENT

MITRE CORPORATION (Cont in next)

(3) Defining the performance, design and test requirements of the Army Test Unit Interoperability Test Center configurations for the various Joint Interoperability of Tactical and Control Systems test segments. In addition, MITRE will assist the Army Test Unit with the Technical Controller functions associated with the Fort Monmouth Interoperability Test Center and its associated remote sites.

(4) Continuation of support to the Executive Test Center at Fort Leavenworth. This will require that MITRE maintain an additional site at Fort Leavenworth during FY 1981.

(5) Assisting the Army Test Unit in developing requirements for, and implementing Joint Interoperability of Tactical and Control Systems test support hardware and software including that necessary for on-line test support, data collection and analysis, and Joint Interoperability of Tactical and Control Systems message preparation aids.

(6) Analyzing and evaluating Compatibility and Interface tests to identify problems, correct deficiencies, recommend solutions, and plans for retesting.

(7) Accomplishing user Joint Interoperability of Tactical and Control Systems message interoperability requirements analyses and development of related engineering and software design criteria.

b. MITRE will provide system research, analysis, planning, engineering, and technical management support to the Center for Systems Engineering and Integration in all phases of its Army Command, Control, and Communications, Joint Interoperability of Tactical and Control Systems-related, systems engineering, architecture, and concept/design activities. This support will include requirements analysis and evaluation of current and planned capabilities to assure maximum effectiveness, interoperability, configuration management and test support. MITRE will support the Center for Systems Engineering and Integration by:

**UNCLASSIFIED**

**UNCLASSIFIED**

Section 6 (contd)

FEDERAL CONTRACT RESEARCH CENTERS

SUMMARY BY APPROPRIATION AND PROGRAM ELEMENT  
(\$ in thousands)

FEDERAL CONTRACT RESEARCH CENTER/APPROPRIATION/PROGRAM ELEMENT

MITRE CORPORATION (Continued)

- (1) Accomplishing user interoperability requirements analyses and development of related engineering design criteria.

(2) Developing system interoperability validation methodology and test planning.

- (3) Supporting NATO Rationalization, Standardization, and Interoperability planning and plan implementation and execution.

12. Central Army Group Command Control Information System.

a. MITRE provides systems engineering support to the US Army Element, Central Army Group Command Control Information System in determining the Headquarters, Central Army Group Command Control Information System requirements, characteristics and required capabilities directed towards the implementation of a Central Army Group Command and Control architecture for the current period through 1985. MITRE is also assisting the US Army Element in defining the Central Army Europe wide Command and Control architecture which will determine the Allied Command expertise required to assist in the analysis and technical action leading to the refinement of the Command and Control system concept for Headquarters, Central Army Group and the planning and implementation of the concept. MITRE provides a team consisting of analysts and technical specialists to work closely with, and under the direction of, the Central Army Group Command Control Information System Element. This team is located at the Central Army Group Headquarters, and as necessary, draws upon the support of specialists located at MITRE offices in the United States.

**UNCLASSIFIED**

**UNCLASSIFIED**

Section 6 (Contd)

FEDERAL CONTRACT RESEARCH CENTERS

SUMMARY BY APPROPRIATION AND PROGRAM ELEMENT  
(\$ in thousands)

FEDERAL CONTRACT RESEARCH CENTER/APPROPRIATION/PROGRAM ELEMENT

MITRE CORPORATION (continued)

b. Principal MITRE FY 1980 activities at the Central Army Group included: (1) support to the Central Army Group required inputs to the Supreme Headquarters Allied Powers Europe Command and Control Requirements Analysis Tasking; (2) the preliminary analysis and documentation of the Central Army Group display requirements; (3) support during exercise CRESTED EAGLE 80 for the design, implementation and evaluation of a display distribution experiment using the Strategic War Headquarters Closed Circuit Television system; and (4) the establishment of a microprocessor based test bed to experiment with graphical display presentation and develop analytical tools or predictive analysis.

c. During FY 1981, MITRE is assisting the Command Control Information System/Command and Control group in the integration of automatic data processing terminals into the Peace and War Headquarters operations. With respect to this effort, MITRE will provide overall planning guidance and assist in staff orientation. Also, development of the initial limited automatic data processing capabilities into an operational system will require MITRE assistance for the derivation and documentation of software specifications for applications programs. Continued MITRE support will be provided to the Command and Control Requirements Analysis effort; also, MITRE efforts will continue to refine and interpret in terms of meaningful graphical presentation the Central Army Group display requirements and investigate predictive analytical techniques ultimately resulting in software specifications for the Central Army Group Command and Control system. Additionally, MITRE will develop suitable engineering options for a viable Leapfrog concept (Alternate War Headquarters). It is anticipated that MITRE will prepare in the 1981 time frame working papers/technical information letters covering the following items: (1) Automatic data processing integration with the Central Army Group Command and Control, concepts of operations/procedures; (2) graphical display requirements specifications; (3) software specifications for the Central Army Group Command and Control applications; (4) planning and results of the liaison officer experiments; (5) possible hardware solutions for Alternate War Headquarters; and, (6) other topics concerning various aspects of the Central Army Group Command and Control system implementation necessary to document urgent problems/solutions.

**UNCLASSIFIED**

**UNCLASSIFIED**

Section 6 (Contd)

FEDERAL CONTRACT RESEARCH CENTERS

SUMMARY BY APPROPRIATION AND PROGRAM ELEMENT  
(\$ in thousands)

FEDERAL CONTRACT RESEARCH CENTER/APPROPRIATION/PROGRAM ELEMENT

MITRE CORPORATION (Continued)

- d. In FY 1982-1983 MITRE will support the Command and Control Information System/Command and Control Group principally in the following areas: (1) continued integration of Command and Control subsystems at the Static War Headquarters as they become available, e.g., CAMPS, SCARS II terminals, and optimization of procedures for integration of all systems; (2) development of software specifications for Peace and Static War Headquarters; and, (3) planning and development of operational concepts in preparation for the dedicated Central Army Group Fourth Allied Tactical Air Force computer installation at the new Ruppertsweiler II Joint Static War Headquarters facility.
13. United States Army Europe Command and Control Information System Implementation.
- a. MITRE is providing system engineering support to the United States Army Europe Command and Control Information System Project Office in the analysis and actions leading to the development and implementation of the US Army Europe Command and Control Information System. This support includes communication system design, technical support in the development of automatic data processing systems, test bed development and implementation, exercise planning and evaluation, technical monitoring of subcontractor support activities and documentation leading to final system implementation. MITRE provides a team consisting of analysts and technical specialists to work closely with, and under the direction of, the US Army Europe Command and Control Information System Project Office. This team is located at the US Army Europe Headquarters, and as necessary, draws upon the support of specialists located at MITRE offices in the United States. MITRE personnel will be assigned to Major Support Command Headquarters, as required, in the performance of their activities. The US Army Europe Command and Control Information System Program objectives are to develop a system which will: (1) provide an effective system for the US Army Europe to perform its combat service support mission during wartime; (2) to achieve the best structure for wartime readiness during peacetime; and, (3) to develop an effective means of transitioning to the US Army Europe wartime NATO support role from its peacetime posture.

**UNCLASSIFIED**

**UNCLASSIFIED**

## Section 6 (Contd)

## FEDERAL CONTRACT RESEARCH CENTERS

SUMMARY BY APPROPRIATION AND PROGRAM ELEMENT  
(\$ in thousands)

## FEDERAL CONTRACT RESEARCH CENTER/APPROPRIATION/PROGRAM ELEMENT

## MITRE CORPORATION (Continued)

b. During FY 1980 the first module of the Operations Subsystem, the Force Tracking System became operational and its effectiveness was demonstrated in a series of exercises. Another major program milestone was achieved with the publication of the initial set of the US Army Europe standard data elements to support interoperability with other systems. The FY 1981 program is based upon development and expanded testing of the various prototype subsystems. A major milestone in FY 1981 is the first demonstration of key attributes of the Command level system.

c. In FY 1982, MITRE will assist in the integration on newly acquired automatic data processing systems of software and hardware and the evaluation of test bed and exercise operations. A major milestone will be the demonstration of the prototype system during CRESTED EAGLE '82. Based upon the results of these tests, functional descriptions will be finalized for subsystem module and integration will begin on operating levels subsystems and command level system modules. The analysis of alternate communications network will be completed and formalized for submission to the 5th Signal Command. MITRE will assist in the review for selection of subcontractors to implement the design. A major task will be the development of formal evaluation procedure for the US Army Europe Command and Control Information System.

d. During FY 1983 efforts initiated in FY 1982 will be continued. Functional descriptions will be completed and support will be provided for the final system components. MITRE will prepare plans for system test, training and overall maintenance of the system. A major milestone will be the use of the integrated system in WINTER '83. Technical support will be provided in monitoring contractor implementation of the final Command and Control Information System configuration.

14. Army Command and Control Master Plan.

a. The Army has recently promulgated the Army Command and Control Master Plan to provide a uniform understanding of total system requirements and to develop an integrated program plan for the development of command and control capabilities. The Army Command and Control Master Plan is to be a "living document" (updated annually) to guide the programs acquisition process and decisions on fielding new command and control capabilities over a five-year planning horizon.

**UNCLASSIFIED**

**UNCLASSIFIED**

Section 6 (Contd)

FEDERAL CONTRACT RESEARCH CENTERS

SUMMARY BY APPROPRIATION AND PROGRAM ELEMENT  
(\$ in Thousands)

FEDERAL CONTRACT RESEARCH CENTER/APPROPRIATION/PROGRAM ELEMENT

MITRE CORPORATION (Continued)

b. MITRE will provide technical support to the Command, Control, Communications, and Intelligence Directorate of the Combined Arms Combat Development Activity, Fort Leavenworth, Kansas. This support will consist of systems research and analysis to support the annual update of the Army Command and Control Master Plan. The initial effort will include documenting a methodology for annual updates which will allow this process to consider information requirements and command and control capabilities within a context of doctrine and tactics (using several levels of conflict expressed as Situations, Actions, and Missions) as well as tactical organizational structure. The methodology is to explicitly address system interface requirements. Integrated baseline system capabilities will be assessed to determine shortfalls in functional capabilities. In addition, longer term research and analysis will be carried out based upon the concept of a unified methodology for the Command, Control, Communications, and Intelligence, as developed by the Combined Arms Combat Development Activity. This will require the determination of an acceptable set of essential elements of analysis, which will include effectiveness-oriented quantitative measures such as measures of effectiveness, measures of performance, and measures of support; and a detailed description of the proposed analytic technique to be applied. Candidate force-on-force models capable of relating Command, Control, Communications, and Intelligence systems capabilities to force effectiveness will be identified and used (singly and jointly, as appropriate) on an interim basis. This overall research effort will be directed in the long run towards the development of a force-on-force simulation "kernel" by means of which individual models or subprograms relating to specific functions and mission areas may be exercised interactively as an evaluation tool. Within the constraints of available resources, attention also is to be directed towards the development of an analytic (to include a model of the information network at corps and below) means of investigating dynamic information loads and flows within the Command, Control, Communications, and Intelligence architecture (DYNAMIC). This work is an extension of the current methodology used in generating the Technical Interface Concept.

c. The Army's publication of the Army Command and Control Master Plan established goals and objectives for a continuing program of integrated planning in the development of cost-effective Command, Control, Communications, and Intelligence capabilities and placed a new priority on the acquisition of much needed capabilities by 1985. Achievement of these high priority goals requires a sustained effort of review and resource planning, as well as the refinement of methodologies appropriate to this task. Annual updates of requirements and the technical analysis of feasible program and system alternatives is an urgent, high priority task having significant impact on Army research, development, and procurement programs in the command, control, communications, and intelligence system area.

**UNCLASSIFIED**

Section 6 (Contd)

**UNCLASSIFIED**

FEDERAL CONTRACT RESEARCH CENTERS

SUMMARY BY APPROPRIATION AND PROGRAM ELEMENT  
(\$ in Thousands)

FEDERAL CONTRACT RESEARCH CENTER/APPROPRIATION/PROGRAM ELEMENT

MITRE CORPORATION (Continued)

15. Transition Communication Planning.

a. The US Army Communications Command is the combat developer and user for the Echelons Above Corps and Defense of the Joint Chiefs of Staff/Defense Communications Command has a Special Transportable mission in the Communications Command provided systems and indigenous systems. It is necessary that the operational architecture of these US Army equipment. There are known incompatibilities with current inventory of the US Army Communications Command and TRI-TAC due to their involvement with the US Air Force in a similar situation.

b. MITRE efforts are required to advise and assist the US Army Communications Command Plans Division in developing the Army portion of the Defense Communications System and Special Transportable Missions. The effort will involve the Echelons Above Corps/Echelons Above Corps, specific engineering analysis, associated cost analysis and technical guidance. The capabilities/limitations (Contingency Plans and Operational Plans) concepts, doctrine, studies, plus associated switching system, systems will efficiently and economically interoperate. This will insure that the various equipments to be used in these

c. In FY 1982, MITRE will provide engineering expertise to advise, guide the transition of TRI-TAC developed equipment and for Special Transportable configuration (in support of the Defense Communications System/Major Army Command Contingency/operational plans). Requirements for this work are expected to continue at least through FY 1984.

**UNCLASSIFIED**

**UNCLASSIFIED**

Section 6 (Contd)

FEDERAL CONTRACT RESEARCH CENTERS

SUMMARY BY APPROPRIATION AND PROGRAM ELEMENT  
(\$ in Thousands)

FEDERAL CONTRACT RESEARCH CENTER/APPROPRIATION/PROGRAM ELEMENT

MITRE CORPORATION (Continued)

The following three areas will commence during this time frame:

- (1) Study and project the trends of the department of Defense and Army and Commercial Communications networks and systems into the post-1985 time frame to determine the overall technical capabilities needed.
  - (2) Analyze the impact of domestic and foreign policies, the Joint Chiefs of Staff and Army objectives, industry research and development, and commercial network developments.
- (1) Determine those key technical features of the US Army Communications Command assigned Communications-Electronics missions (e.g., Echelons Above Corps, Army Base Communications, Strategic Army Communications System, etc.) that are subject to being impacted adversely or favorably by external drivers.

16. US Army Communications Command Command and Control Technical Support.

- a. The US Army Communications Command World-Wide Military Command and Control System Management Office has the responsibility for the World-Wide Military Command and Control System Selected Architecture as well as a support mission for other US Army Communications Command Command, Control, and Communications projects. These programs include the Joint Crisis Management Capability, Jam-Resistant Secure Communications Upgrades, US European Communications, US Nuclear Forces Command, Control, and Communications Upgrades, Army Command and Control Master Plan, and other anticipated Control System Management Office programs during the current and past fiscal years and the requirement for MITRE support will continue for the future years. These programs are of a high-level priority within the Department of Defense and program schedule constraints make it highly advisable to continue to employ the services of MITRE.

**UNCLASSIFIED**

Section 6 (Cont'd)

**UNCLASSIFIED**

FEDERAL CONTRACT RESEARCH CENTERS

SUMMARY BY APPROPRIATION AND PROGRAM ELEMENT  
(\$ in Thousands)

FEDERAL CONTRACT RESEARCH CENTER/APPROPRIATION/PROGRAM ELEMENT

MITRE CORPORATION (Continued)

b. During the past fiscal year MITRE provided support in the engineering design and analysis of the Tactical Nuclear Forces Command, Control, and Communications communication facilities and in the development of requirement and specifications for the Joint Crisis Management Capability and the Jam-Resistant Secure Communications terminals. In addition, MITRE participated in the Tactical Nuclear Forces Command, Control, and Communications planning efforts identifying the system analysis and technical criteria to be used in the selection and evaluation of the Tactical Nuclear Forces Command, Control, and Communications communications upgrades.

c. During FY 1982 and FY 1983, MITRE will continue to assist the US Army Communications Command World-Wide Military Command and Control System Management Office in their technical planning, engineering and direction efforts in support of US Army Command, Control, and Communications programs. The effort will involve the development of management and implementation plans, the preparation of technical analysis and associated cost estimates, specific engineering analysis, and technical guidance on the current and future command, control, and communications programs supported by the US Army Communications Command World-Wide Military Command and Control System Management Office. Specifically, emphasis will be on efforts in support of the Joint Crisis Management Capability, the Jam-Resistant Secure Communications, the Tactical Nuclear Forces Command, Control, and Communications, the Army Command and Control Master Plan, and European Theatre Command Centers.

17. Army Base Information Transfer System/Walter Reed Medical Center Information Transfer System.

a. MITRE efforts are required for continuation of support to the Army Base Information Transfer System/Walter Reed Medical Center Information Transfer System. In prior years, MITRE developed and implemented a patient registration system upgrade; monitored design of production engineering Bus Interface units; provided testing, evaluation, and certification of production engineering Bus Interface units; implemented technical control system; and assisted in design of high resolution for fluoroscopy video tests.

**UNCLASSIFIED**

**UNCLASSIFIED**

Section 6 (Contd)

FEDERAL CONTRACT RESEARCH CENTERS

SUMMARY BY APPROPRIATION AND PROGRAM ELEMENT

(\$ in Thousands)

FEDERAL CONTRACT RESEARCH CENTER/APPROPRIATION/PROGRAM ELEMENT

MITRE CORPORATION (continued)

b. In FY 1981, MITRE is providing continued System Engineering support to Walter Reed Medical Center, the Army Medical Department, and the Tri-Service Medical Information System in the implementation and interfacing of communications systems. The communications systems to support the medical Automatic Data Processing systems within the Army Medical Department will be an integrated multi-mode communications systems typified by the Walter Reed Information Transfer System installed and tested at the Walter Reed Medical Center under the Army Base Information Transfer System/Walter Reed Information Transfer System project over the last two years. Work to be performed by MITRE during 1981 is to (1) provide continuing technical support in interfacing the major Hospital Information System onto the Walter Reed Information Transfer System cable at the Walter Reed Medical Center; (2) provide the design, installation, testing, and monitoring of a technical control/performance monitoring system at Brooke Army Medical Center, Fort Sam Houston, Texas; (3) continue to provide support in interfacing Automatic Data Processing medical systems such as the patient appointment system, record tracking system, and the clinical laboratory system onto the Walter Reed Information Transfer System cable at the Walter Reed Medical Center; (4) continue to provide technical support in interfacing Automatic Data Processing medical support systems such as the inpatient accounting system, physiological monitoring system, clinical laboratory system, record tracking system, patient appointment system with the Hospital Information System at Walter Reed Medical Center; (5) continue to provide support in designing, implementing, and/or upgrading integrated communication systems at Army Medical Treatment Facilities to support the Tri-Service Medical Information System, local Automatic Data Processing, and other communications requirements; (6) provide support in the operational use of the production Bus Interface Units; (7) continue to assist the Tri-Service Medical Information System-Army in implementing and interfacing the Tri-Service Medical Information Systems and communication requirements into Army Medical Treatment Facilities; (8) continue to specify changes to and provide technical assistance in upgrading communications in Army Medical Treatment Facilities to take advantages of new technology in the Bus Interface Units and broadband multimode communication techniques.

c. During FY 1982-1983, MITRE will develop request for procurement documents to enhance current Bus Interface Units design; provide evaluation and design and implementation of the Tri-Service Medical Information System Automatic Data Processing system; develop Bus Interface Units software; assist in the design and installation of broadband communication systems; and, assist in the interface of multi-mode communication systems.

**UNCLASSIFIED**

**UNCLASSIFIED**

Section 6 (Contd)

FEDERAL CONTRACT RESEARCH CENTERS

<u>FEDERAL CONTRACT RESEARCH CENTER/APPROPRIATION/PROGRAM ELEMENT</u>	<u>SUMMARY BY APPROPRIATION AND PROGRAM ELEMENT</u>			
	<u>FY 1980 ACTUAL</u>	<u>FY 1981 ESTIMATE</u>	<u>FY 1982 ESTIMATE</u>	<u>FY 1983 ESTIMATE</u>
<u>TOTAL PROGRAM SUMMARY BY APPROPRIATION</u>				
Research, Development, Test and Evaluation, Army . . . . .	20,794	22,922	26,750	29,134
Operations and Maintenance, Army . . . . .	<u>2,800</u>	<u>3,192</u>	<u>3,814</u>	<u>4,519</u>
Total Federal Contract Research Center Requirement . . . . .	23,594	26,114	30,564	33,653
Subcontract effort excluded from this amount . . . . .	11,146	15,459	16,619	17,600

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DEPARTMENT OF THE ARMY  
RESEARCH, DEVELOPMENT, TEST AND EVALUATION, ARMY  
MAJOR IMPROVEMENTS TO AND CONSTRUCTION OF GOVERNMENT-OWNED  
FACILITIES FUNDED BY RDT&E, ARMY APPROPRIATION

**Section 7****PART 1. UTILIZATION OF SECTION 2353, TITLE 10, AUTHORITY**

Specialized R&D facilities and/or equipment determined to be necessary for the performance of a contract for a military department for research and development may be constructed by or furnished to the contractor and funded from appropriations available for research, development, test and evaluation. The Congress enacted this legislation, now 10 U.S.C. 2353, in 1956. This policy is executed through DOD Directive 4275.5. Under this policy, the Secretaries of the military departments or their designees, and the Directors of Defense Agencies may approve facilities projects up to \$3,000,000; the Under Secretary of Defense Research and Engineering approves projects exceeding \$3,000,000. The Congress is notified in advance of starting any project involving construction, regardless of the dollar amount. The table below provides a summary listing of all such projects accomplished in FY 1981, FY 1982, and FY 1983.

RDT&E Facility/Equipment	Project Number	Contractor	Location	Total Obligational Authority (Thousands of Dollars)	
				FY 1980	FY 1981
<b>SECTION I</b>					
Projects Accomplished or Underway				Negative	
SECTION II					
Projects Planned or Projected				Negative	

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**Section 7 (Cont'd)**

**MAJOR IMPROVEMENTS TO AND CONSTRUCTION OF GOVERNMENT-OWNED  
FACILITIES FUNDED BY RDTE, ARMY APPROPRIATION**

**PART 2. UTILIZATION OF RDTE APPROPRIATION FOR FACILITIES AT GOVERNMENT-OWNED/GOVERNMENT-OPERATED INSTALLATIONS**

The RDTE appropriation may finance the development, design, purchase, and installation (including directly related foundations, shielding, environmental control, weather protection, structural adjustments, utilities and access) of equipment or instrumentation required for research, development, test and evaluation activities. The table below provides a summary listing of all such projects for the installation of equipment, where the cost of installation is \$100,000 or more, accomplished in FY 1981, FY 1982, and FY 1983.

Facility/Equipment	RDTE Project Number	Location	Total Obligational Authority (Thousands of Dollars)				
			FY 1980	FY 1981	FY 1982	FY 1983	
<b>SECTION I</b>							
Projects Accomplished or Underway							
Anechoic Chamber for Microwave Research	612771.A805	Walter Reed Army Institute of Research, Building 40 WRAMC, Washington, DC	150	-	-	-	
Building alterations to accommodate laser research	623710.DK70	Bldgs 317 and 357, Night Vision & Electro-Optics Laboratory, Fort Belvoir, Virginia	432	-	-	-	

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**UNCLASSIFIED****Section 7 (Contd)****MAJOR IMPROVEMENTS TO AND CONSTRUCTION OF GOVERNMENT-OWNED  
FACILITIES FUNDED BY RDTE, ARMY APPROPRIATION**

Facility/Equipment	RDTE Project Number	Location	Total Obligational Authority (Thous. mils of Dollars)				
			FY 1980	FY 1981	FY 1982		
<u>SECTION II</u>							
Projects Planned or Projected							
Computer Room Air Conditioning	611102.B52C 612707.A855	US Army Engineer Topographic Laboratory, Building 2592 Fort Belvoir, Virginia	-	2'0	-		
Installation of 29 Built-in Sterilizers (Replacement)	665801.MM32	USA Medical Institute of Infectious Diseases, Building 1425 Fort Detrick, Maryland	-	516	516		

**PART 3. UTILIZATION OF RDTE APPROPRIATION FOR MINOR CONSTRUCTION**

For in-house installations, construction projects in support of R&D for \$100,000 or less are funded from RDTE appropriations. Such expenditures are authorized by 10 USC 2674 and the applicable provisions of the current DOD Appropriations Act. Under this procedure, project approval at this level is authorized by the Major Command concerned, or delegated to R&D installation commanders as appropriate. The table below provides a summary total of such minor construction accomplished in FY 1980, and the estimated amounts planned for FY 1981, FY 1982, and FY 1983. All minor construction must result in a complete and usable facility. In no event is two or more minor construction projects or minor and major construction projects to be contrived to form a usable facility.

**SUMMARY OF MINOR CONSTRUCTION FUNDED BY RDTE, ARMY**

	FY 1980	FY 1981	FY 1982	FY 1983
	3,136	3,725	2,977	2,674

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Section 7 (Cont'd)

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MAJOR IMPROVEMENTS TO AND CONSTRUCTION OF GOVERNMENT-OWNED  
FACILITIES FUNDED BY R&TE, ARMY APPROPRIATION

R&TE INSTALLATION PROJECT FACT SHEET  
(Supporting Projects Over \$400,000)

I. Facility/Equipment: Alter Buildings 317 and 357 to include partitions, recessed lighting, suspended ceiling, provisions for air, gas, and chemical piping, repair walls, repair windows, sinks, workbenches, fumehoods and exhausts, repair floors. Install warning lights and electrical safety devices.

II. R&D Program Element: 6.37.10.A

III. R&D Project Number: DK70

IV. Location: Night Vision and Electro-Optics Laboratory, Fort Belvoir, Virginia

V. R&D Funds Programmed: FY 1980 \$412,000

VI. Other Funds: None

VII. Relationship to R&D Program Element: This construction alterations, equipment installation, maintenance and repair are required to provide modern laboratory facilities for research, development, experimentation, technical data recording, experimental fabrication and testing for various types of laser devices to be utilized for distance ranging, fire control and target designation/signature.

VIII. Rationale for Funding Effort in R&D: Less than \$75,000 of this effort is for construction, the remainder is for installation of equipment in place. This facility is used solely for R&D missions and is fully supported and operated with R&D funds.

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Section 7 (Contd)

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MAJOR IMPROVEMENTS TO AND CONSTRUCTION OF GOVERNMENT-OWNED  
FACILITIES FUNDED BY R&D, ARMY APPROPRIATION

**R&D: INSTALLATION PROJECT FACT SHEET  
(Supporting Projects Over \$400,000)**

- I. Facility/Equipment: Replace 29 built-in sterilizers.
- II. R&D Program Element: 6.5R.01.A
- III. R&D Project Number: MM12
- IV. Location: US Army Medical Research Institute of Infectious Diseases, Building 1425, Fort Detrick, Maryland
- V. R&D Funds Programmed: \$2,064,000 for four-year period beginning FY 1981
- VI. Other Funds: None
- VII. Relationship to R&D Program Element: This program element is used to fund activities which benefit all R&D projects supported in R&D laboratories.
- VIII. Rationale for Funding Effort in R&D: This facility and equipment is used solely for R&D missions.

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DEPARTMENT OF THE ARMY  
RESEARCH, DEVELOPMENT, TEST AND EVALUATION, ARMY  
PROJECT DATA FOR CONSTRUCTION AT GOVERNMENT-OWNED  
FACILITIES FUNDED BY RDTE, ARMY APPROPRIATION

Section 8

NOT APPLICABLE

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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER  N/A	2. GOVT ACCESSION NO.  AD-A101505	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle)  Department of the Army Justification of Estimates for Fiscal Year 1982 Submitted to Congress January 1981		5. TYPE OF REPORT & PERIOD COVERED  Army RDTE Budget Justification FY 1981
7. AUTHOR(s)  Department of the Army		6. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS  HQDA, Office of the Deputy Chief of Staff for Research, Development, & Acquisition (DAMA-PPR-B), Washington, DC 20310		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS  HQDA, Office of the Deputy Chief of Staff for Research, Development, & Acquisition (DAMA-AOA-S), Washington, DC 20310		12. REPORT DATE  January 1981
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)		13. NUMBER OF PAGES  94
		15. SECURITY CLASS. (of this report)  UNCLASSIFIED
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT (of this Report)  Approved for public release, distribution unlimited.		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number)  Army Research, Development, Test and Evaluation Budget Justification Book for justification of estimates submitted to Congress in January 1981 for Fiscal Year 1982.		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number)		